ESTABLISHED IN 1872

PAPER TRADE JOURNAL

With Which Is Combined

Vol. XCIII, No. 22 PULPED Thursday, November 26, 1931

Proposed Big News Print Merger Developments

Canadian Business and Banking Interests Taking Lead in Negotiations—E. W. Beatty, President C. P. R., Appointed Chairman of Committee, Which Includes Sir Charles Gordon, President Bank of Montreal; M. W. Wilson, General Manager Royal Bank of Canada; and Sir Joseph Flavelle, Director Canadian Bank of Commerce

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., November 23, 1931—It is now announced that E. W. Beatty, president of the Canadian Pacific Railway, is chairman of the special body of leading business men who are working on the proposed giant merger of Canadian news print companies, particulars of which were given in last week's PAPER TRADE JOURNAL, and that others associated with him include Sir Charles Gordon, president of the Bank of Montreal; M. W. Wilson, general manager of the Royal Bank of Canada; and Sir Joseph Flavelle, director of the Canadian Bank of Commerce. The net result of the negotiations so far is that a committee, appointed at last week's meetings, is now engaged in considering the various factors which would enter into the creation of the proposed consolidation.

The situation has not yet developed to a point at which a definite basis for the deal has been discussed, but this much appears evident, namely, that the initiative in the proposition has been taken by the banking interests, and this view is strengthened by the fact that the gentlemen named above, who are working with the representatives of the news print companies, are recognized spokesmen for the three most-powerful banks in Canada.

The banks are evidently desirous of protecting themselves, in view of the fact that they have heavy commitments in the news print industry. One newspaper, which has been endeavoring to find the extent of the indebtedness to the banks, has compiled a list showing bank loans of some of the larger operators at the end of 1930. This list, which is by no means complete, and which it is further stated, does not accurately portray the current situation, is as follows:

(Year ended December 31, 1930, in nearly all cases)	
St. Lawrence Corp.	$1,446,378
Donnacona	767,012
Price Bros.	2,333,241
Minnesota & Ontario	3,600,000
Mersey	3,853,000
Canada Power	15,116,000
Abitibi	4,500,000
Inter. Paper (amount unknown)	.....
Howard Smith	1,637,000
Hinde and Dauch	200,000
Firstbrook Boxes	213,328
Fraser	5,360,000
Fraser (overdraft)	18,628
Fraser (loan on mtge.)	1,000,000

In view of the fact that the Canadian International Paper Company is included in the proposed consolidation, it is considered significant that announcement was made during the past week by International Paper Company that a meeting of shareholders would be held on December 5 to ratify the segregation of the New England Power properties and their sale to the International Hydro Electric System, another subsidiary of International Paper and Power Company. The big United States paper company has been a party right along to the merger negotiations, hence the disposal of its power holdings may have a bearing on the resumption of merger conferences. An interesting rumor is that the Corner Brook mill of the International Paper Company in Newfoundland maybe included in the merger.

Price Bros. & Co. May Be Included

Another interesting feature is the mention that Price Bros. & Co. may be included in the merger. In the past this company has kept aloof from consolidation proposals. Col. J. H. Price, the head of the Company, stated in an interview during the week his belief that a comprehensive amalgamation would work out to the material benefit of the industry as a whole. He made no reference to his company being concerned in the present negotiations.

In newspaper discussion the inclination is to rule out the E. B. Eddy Company, which is said to be controlled by International Paper, and which is engaged in many of the branches, of paper making besides news print, and it is also thought that the J. R. Booth Company might not be interested.

Then there is the view that newspaper publishers in the United States, who buy most of the production of the mills concerned, might offer opposition through the fear of the combination using its position to boost prices. This, however, is only newspaper talk. It has been expressly stated that economies in operation and not higher prices are the object of the negotiations. Furthermore those who profess inside knowledge declare representative news of publishers have already been sought, and that these are favorable, as it is considered that a general reorganization which would do away with many costly duplications and expensive methods and haulage would be far more in the interests of the publishers than a continuance of present conditions.

Pennsylvania Paper Mills Are Marking Time

Although Inquiries Are More Persistent, Orders Are Slow In Landing—Manufacturers of Book Papers Report Fair Volume of Advance Contract Orders for Coming Year—Paper Board and Roofing Plants Continue to Curtail Operations

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., November 23, 1931.—With steadily improving demand for many lines of papers, the Philadelphia industry is growing more active. There is bulked greater volume of paper purchases, though normal paper buying is nowhere to be found, sales being chiefly of day to day type. A few publishers and large printers are buyers under contract for remainder of the year's supplies and are looking ahead to the new year's contracts at the present reduced rates where business of the future, already advanced, warrants. Prices generally on book papers, krafts, tissues, sulphite bonds, and a few others, are said to be on a lower level than they have been for the past twenty years.

The waste paper market is very spotty with extremely dull periods intervening between slightly better days of buying among mills. Prices of the cheaper grades have been reduced and are now the lowest of the year. Few of the better grades of paper stock are to be found. Wholesale waste paper dealers state that the competition of low priced wood pulp is working against the waste paper market.

Paper mills in the local area are marking time with a few mills on from three to four days a week. Inquiries are better among manufacturers, but orders are slow in landing. Those mills in the local territory, but not in vicinity of the Quaker City, devoted to manufacture of book papers, are most active and report a fair volume of advance contracts for the new year. Board and roofing mills remain quiet. Glassine manufacturers are fairly active in seasonal operation. There is a growing demand for cellophane and cellophane combined with glassine, which resulted in some stimulation of the glassine demand.

American Bag & Paper Adds Cellophane Products

The American Bag and Paper Company, Water and South streets, of which Samuel Kardon is head, has spent over $55,000 in equipping its plant for the production of cellophane bags and wraps. The firm has now a complete mechanical division for the manufacture of coffee bags of cellophane or cellophane combined with paper and for cellophane wraps, which opens an entirely new department for the company apart from its former lines of standard bags and specialties in coal and shopping sacks. The equipment provides for multi-color printing on cellophane. The production in cellophane includes straight, cut, and duplex bags and wraps of all sizes and for a variety of purposes. The coffee bags are printed in multi-color and gold. The American Bag and Paper Company is now one of the most complete equipped plants for the production of cellophane bags and wraps for its size in this section. The firm has long been engaged in the production of a general line of paper bags.

Cellophane for Milprint Products Corp.

Another large local glassine and carton manufacturing plant that has in recent times been equipped at considerable expenditure with units for the production of cellophane wraps and bags, is the John M. Driver Company Division of the Milprints Products Corporation, 57th street and Lancaster Avenue. The Philadelphia or Eastern plant of the Milprint Products Corporation, of Milwaukee, is now entirely devoted to production of cellophane products of this character. New bag and printing equipment for multi-colored work has been installed and the plant is now in full production of cellophane and cellophane-glassine combination bags for bakery, confectionery, small merchandise, shoes and other purposes, with display bags plain or in colored designs. The local staff, under management of John Meagher, has been increased 20 per cent which has been made necessary in order to take care of growing demand.

Champion Paper Tube Co. Expands

With further additional units installed recently in the plant of the Champion Container Company, Inc., 3rd and Somerset streets, the company has broadened its specialties to include winding spools for braids, narrow tapes and fabrics, wires, insulated wires and its own patented shipping drums that are moisture proof and made of fibre in from 2 gallon to 28 gallon sizes. The paper spools are of heavy kraft board and papers. These new products will be ready for the trade by December 1 and are now under production. Gordon F. Smith, head of the firm, has been linked with the Quaker City converting trade for many years.

General Adds New Tubes

An entirely new line of paper tubes are produced by the General Paper Tubes Company, 430 East Chelten Avenue, manufacturers of paper tubes for the textile trades and for mailing and other purposes. The new lines, which have been added under direction of N. B. Trucksess, head of the company, are plush and tapestry and its own mailing tubes for safety conveyance in the mail.

Charles Beck Paper Co. Adds Caslon Bonds

The Caslon bonds, made by the Munising Paper Company, Munising, Mich., have been added to the fine papers handled by the Charles Beck Paper Company, 401 North Broad street, the oldest fine and box paper concern in the Quaker City dating back to more than 75 years. The Caslon bonds are stocked in the wide range of sizes and colors produced by the manufacturers. There now are three Philadelphia paper houses carrying these widely distributed bonds.

Willard E. Jones Passes

Willard E. Jones, president and general manager of Aatell & Jones, Inc., manufacturers of paper products, 1314 South Howard street, passed away at his home, 112 North Carol Boulevard, Highland Park, last week, from an attack of acute rheumatic fever. Mr. Jones was 37 years of age. Surviving are his widow, Mrs. Hilda M. Jones; his mother, Mrs. Mary Allen Jones, and his sister, Eleanor Jones, both of Dunmore, Pa. Mr. Jones was a member of Melita Lodge F. and A. M.

Escanaba Paper Co. to Expand Operations

Following Erection of Addition to Plant at Escanaba, Mich., Production of Sheet News Print Is to be Started Within Few Weeks—Building Will Have Every Modern Facility for Proper and Efficient Handling of Sheet Output, Wrapping and Shipment

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 23, 1931.—Manufacture of sheet news print as a means of keeping its mill at capacity operation is to be started within the next few weeks by the Escanaba Paper Company, Escanaba, Mich., following the erection of an addition to the plant. The addition will be 50 by 75 feet in size, two story, and will house a Hamblet duplex cutter and a single cutter, sizes 70 and 100 inches. An 8-ton trimmer-cutter also is being installed. The building will have every modern facility for the proper and efficient handling of sheet production, and wrapping and shipment. Construction was accomplished with speed so as to get into production early.

"This expansion program is being undertaken for the purpose of taking care of the additional business in sheet paper that we have secured," Joseph H. Slater, general manager explained. "It is also planned to make a variety of colored sheet paper. This change has been brought about by the intense competition in the manufacture of roll news print. It is calculated that by having additional equipment to take care of orders for sheet paper, we can keep the mill operating 100 per cent."

Paper Box Makers Busier

With a revival of orders, the Hummel & Downing Company, paper box manufacturers, of Milwaukee, Wis., has added fifty additional workers, according to announcement of John L. Barchard, president. "We now have more persons employed than at this time last year," Mr. Barchard stated. "This has been made possible also by staggering employment. Where we worked the paper mill on three eight-hour shifts, we now work it on four six-hour shifts. We have also changed the hours in other departments from nine and three-quarters a day to eight to spread the work. We have found labor very willing to co-operate in the stagger plan in order to help one another." Mr. Barchard said also that no workers had been laid off at any time during the trade decline.

Thilmany Pulp & Paper Expansion

Forms are being constructed for the large new warehouse of the Thilmany Pulp and Paper Company, Kaukauna, Wis. Concrete will be used for the foundation and skeleton, with brick facing. About forty men are employed and it is expected the work will be completed in about a month. Permanent Construction Company is doing the work. The warehouse is built in anticipation of the installation of another paper machine, and absorption of the production of the Wisconsin Tissue Division, whose two machines are being set up after removal from an abandoned branch mill at Appleton, Wis.

Forestry Appropriation

Appropriation of $1,500,000 for forestry work is contemplated by the Wisconsin legislature when it meets in special session this week at the capitol at Madison. This will be part of a fund of $8,000,000 for unemployment relief. This money will be used on reforestation work on state owned lands in the cutover area of northern Wisconsin, where much of the pulpwood supply is obtained. Single men will be employed largely, in camps to be set up in the woods, as a means of taking care of this large element of the state unemployed.

One of the subjects to be scheduled for legislative consideration is compulsory unemployment insurance. The mill owners and other industries, through the Wisconsin Manufacturers association, are trying to forestall government interference by adopting a plan of their own. The association held a meeting in Milwaukee last week at which a system was adopted providing for an insurance fund in slack times, to which the employers will contribute equally with the workmen. An expert will be engaged by the association to work out a feasible plan that will function without approximating a dole, and based on successful ideas already in use in other plants. D. C. Everest, vice president and general manager of the Marathon Paper Mills Company, is one of those actively interested in the project.

News of the Industry

After hauling about 150,000 tons of coal to paper mills of the Fox River Valley, the tugs and barges of the Fox River Navigation Company have been put up for the winter at Kaukauna, Wis. The company is owned cooperatively by the paper mills as a means of cheap transportation of coal from the Great Lakes receiving docks at Green Bay, Wis. The tugs made 385 trips during the season, hauling about 400 tons on each load. Part of the crew will be employed all winter reconditioning the boats for the next season. Navigation on the river officially closes on November 30.

L. A. Crittenton, of Chicago, spoke at safety meetings held at Rhinelander and Stevens Point, Wis. last week. George Roller, of the Rhinelander Paper Company presided at the Rhinelander meeting, at which 164 men were present. A theater building housing the Stevens Point meeting was nearly filled. Mr. Crittenton laid stress on the individual practice of safety, and a constant enthusiasm for it on the part of foremen. He urged comparative records well displayed so as to show the progress of safety in each plant as a means of stimulating interest.

Coffer dams on the new power dam constructed by the U. S. Engineering department on the Fox River at Kaukauna, Wis. are being removed. All of the concrete has been poured and the abuttments and spillways are completed. A wall of loose stone will be built to replace an old retaining wall. About forty men were employed on the project.

Employes of the Rhinelander Paper Company and the Daniels Manufacturing Company are participating practically 100 per cent in a campaign for relief funds at Rhinelander, Wis. The money will be used this winter to take care of the unemployed.

The death of W. W. Johnson occurred last week at the home of a daughter, Mrs. Charles Wiester, at St. Paul, Minn. Mr. Johnson was superintendent of the Kimberley-Clark Corporation's mill at Kimberley, Wis., for a number of years and left there for St. Paul about fifteen years ago. He resided at one time at Chillicothe, Ohio. He was 65 years old at the time of his death.

Chicago Paper Market Practically Unchanged

Demand for Various Grades of Fine Paper Somewhat Irregular — While Lower Grades of Bond Paper Are Moderately Active, Better Grades Are Arousing Little Interest—Kraft Wrapping Paper Situation Fails to Show Any Improvement

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., November 21, 1931—Whereas it has been indicated that October would be the low month for the paper trade, indications now seem to point to the fact that November will be a close rival for this dubious honor. No material changes were noted in the general market over the preceding week. Reports indicate that one can purchase kraft for "almost any price" and the tonnage now being sold is being disposed of, say reports, for a cost so low that it will not cover production and distribution charges. The bag market is correspondingly weak.

No unusual demand is reported in the best grades of bonds, but inquiries and orders seem to be more active in the lower grades, although prices are reported as "uncertain". The board market is very slow and unchanged over the past week. Tissues have not met with the seasonal response expected, according to reports, and unseasonally warm weather has contributed to the stagnation in retail outlets. News print conditions are not improved over the past week's report and the nearness of the time for contract renewals is injecting a certain amount of uncertainty and "nervousness" into the market. Advertising lineage upturns have not materialized to any appreciable extent. The waste market is moving with the regular grades and is dull in nearly every particular, say reports.

Mayor Cermak to Address Paper Merchants

Two Chicago political leaders, Mayor Anton J. Cermak and Alderman Barnett Hodes, will provide the speaking entertainment at the annual meeting of the Chicago Paper Association to be held at the Bismarck Hotel, Chicago on the evening of November 24. According to Jim Danehy, chairman of the committee in charge of arrangements, the meeting will get under way with the kind of a dinner for which the Bismarck Hotel is famous, will continue with the appearance of Mayor Cermak and Mr. Hodes and will conclude with election officers for the next year The nominating committee has not tipped its hand and no one knows as yet whether the able D. F. Peck, of the Hanchett Paper Company, will again be pressed into service as president. Plenty of entertainment will also be included in the evening's program. Despite conditions in their industry the coarse paper executives are already planning special cooperative effort in 1932 to turn the tide in their favor.

News of the Trade

The Printers Supplymen Guild, quite an organization in its field, held an enjoyable "paper night" at the Hamilton Club recently. It was the same evening as that on which the Salesmen's association enjoyed their golf frolic and the Hamilton Club must have been paper headquarters for sure during that evening. An interesting program was arranged for the "paper night" with O. H. Runyan, well known state representative of Bradner, Smith & Co. giving an interesting history of paper making, including special emphasis on those steps of most interest to the printers in attendance. N. A. Altmann, of the Butler Paper Corporation, was also present to answer many questions concerning paper and paper making. Mr. Altmann described several processes in paper making and, to the interest of all concerned, spoke concerning the causes for much of the trouble that printers have with certain kinds of paper. The meeting was exceptionally well attended.

It is reported that a well known Chicago typographical designer is working out a series of letter heads and office forms for the Munising Paper Company to be used in connection with the 1932 Caslon Bond Portfolio to be issued by that company. The 1932 Caslon Bond Printing Sales Campaign, of which the Caslon Bond Portfolio of Business Printing is an important unit, will be ready about January 1, according to the report.

Somebody in the Eastern Manufacturing Company advertising offices utilized a splendid idea to present the latest of the series on Atlantic Bond. A blue colored stock with black background and bearing the title "Winged Messages with Winning Numbers on Atlantic Bond", gets the curious prospect off to a flying start. An airplane illustration features the cover and, tucked underneath the center of the wing span are four sheets of paper bearing the numbers "186,000", "20-24", "50-50" and "12-12". Each of these pieces, when unfolded, gives an interesting selling talk on the quality of Atlantic Bond, on the usefulness of good paper and on the twelve colors in which Atlantic Bond is made. It is a clever method of attracting instant interest—with results.

"Printing in the Sixties" is the interesting title of Number 69 of Westvaco Inspirations for Printers, the latest of the West Virginia Pulp and Paper Company series. In keeping with former standards, the issue is full of interesting discussions on equally fascinating subjects. "Printing in the Sixties", is a contribution to printing history, and is splendidly illustrated. Other topics discussed are "Actually *vs.* Fiction"; "The Wood Cut", a most interesting story of its modern development; "Plenty of Impression"; "Advertising-The Master Conjurer" and "Red and Green for December", the latter a timely essay on holiday efforts.

An effective way of getting a message over is used by the Swigart Paper Company, 717 South Wells street. On a complete sample folder the advertising message is neatly typed covering the selection of Hammermill Bond from a collection of bond papers, the test selection being made by a group of 38 business men. The lack of frills, the forceful copy, and the plentiful set-off of white space make the message specific and interesting.

The Middle West Division of the Salesmen's Association of the Paper Industry is permitting a lull in special Monday program activities, evidently to permit the salesmen who attend the opportunity to thoroughly discuss business conditions in various lines. No guest speakers have been on the program for the past two Mondays but a renewal of the effective series of presentations is expected after Thanksgiving.

A son, Michael J. McNulty the 2nd, was born Wednesday morning November 18 to Mr. and Mrs. Michael McNulty. Considering the new arrival's ten pounds of weight, orates the proud father, he may become a logical contender for the "big gates" with Mr. and Mrs. Gene Tunney's boy. The very young Mr. McNulty is the son of one of the go-getters at the McNulty Paper and Twine Corporation. Exerybody, including Michael J. senior, is doing fine.

Let the *figures* decide

Forget about prestige . . . fine principles . . . pride . . . good will. Instead, figure the worth of Bird Centrifiners purely on a dollar basis . . . in terms of *dollars saved* (through reductions in rejects and a dozen other operating economies) . . . and in terms of *dollars earned* (through better sales of *clean* paper).

Cold figures of this kind have put over $50,000 worth of Centrifiners *in one mill alone*. Good will, prestige and so on are extra returns, thankfully received, *but not paid for*. Write; let us place in your hands the facts on Centrifined paper.

BIRD MACHINE COMPANY **SOUTH WALPOLE, MASSACHUSETTS**

manufacturers of the Bird Centrifiner under license from the Centrifugal Engineering & Patents Corp., owners of the Erkensator Patents.

BIRD CENTRIFINERS

5202

Boston Paper Trade Association Meets

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 23, 1931—Featured by a good attendance and a distinct note of optimism for the spiritual element in American civilization and business life by the speaker of the evening, John B. Kennedy, associate editor of *Collier's*, the Annual Fall Meeting of the Boston Paper Trade Association was held at the Exchange Club Wednesday evening, November 18. Group singing, led most efficiently by E. Lindsay Cummings, was one of the enlivening portions of the program. "America" was sung, all standing, at the close of the dinner. Preceding the banquet a reception was held.

Seated at the head table were President Albert R. Smith, John B. Kennedy, First Vice-President Charles A. Esty, Second Vice-President Frank B. Cummings, Treasurer Thomas H. Casey, Secretary F. Bendel Tracy, Arthur W. Blackman, Floyd H. Blackman, A. J. Raybold and H. A. Moses.

President Smith Welcomes Guests

Opening the post-prandial exercises, President Smith expressed regret that Francis Ouimet, national amateur golf champion, who was to have been one of the speakers, was unable to be present. He read a telegram from Mr. Ouimet: "Exceedingly sorry cannot be with you tonight. Business has detained me tonight."

The toastmaster said he was glad to see so many present and that he never knew a finer contact than with paper trade men. He then read a humorous verse, "Why Worry?" and at its conclusion said that would be the only reference to business that evening. President Smith said that it was a pleasure to have at the dinner the president of the National Paper Trade Association, Arthur W. Blackman, and his son, Floyd H. Blackman, president of the New England Paper Merchants Association. It was voted to omit the minutes of the last meeting, although President Smith recalled the words of Governor Ely at that meeting, that he wished the business of the legislature might be accomplished with as much despatch as that of the Boston Paper Trade Association. A report of the secretary brought forward the name of Charles J. Brown, of the J. P. Lewis Company, Beaver Falls, N. Y., as a candidate for special membership, proposed by Lawson Ramage. On vote of the meeting the secretary cast one ballot for his election. The president appointed the following nominating committee to bring in names for officers to be voted on at the January meeting: Charles S. Proctor, M. Lester Madden, John W. Vivian, John E. A. Hussey and Charles L. Baird.

John B. Kennedy Speaks

President Smith then introduced Mr. Kennedy. In his opening words, Mr. Kennedy said he felt that it was appropriate to remark at a gathernig of paper trade men that in the course of his journalistic career he had ruined reams of paper. The speaker emphasized the spiritual change which the depression had brought. He had lived some time in Europe as a reporter and observed a note of admiration in the European press as to the way in which America was taking the depression.

Mr. Kennedy mentioned that he had the last interview with the late President Charles W. Eliot, of Harvard University, which Dr. Eliot had ever given, and quoted his words, "If all you can think of is yourself you are in a bad way." President Eliot, he said, thought that unselfishness was the greatest thing and that the United States had shown more unselfishness than other nations. The spiritual civilization of a nation was to be measured by its art. Dr. Eliot went on to regret the decline of interest in culture and poetry.

Referring to the words of George Bernard Shaw, who said America had produced more crime, the speaker admitted this was true, because there was more prosperity and this produces more cupidity and more violence. "The most recent crime, however, the Great War, was not committed by America. In the aftermath of that great crime, the one only unselfish hand in the conference was America's."

Those Who Attended:

Those present included the following: W. J. Raybold, John B. Kennedy, Albert R. Smith, F. Bendel Tracy, T. H. Casey, H. A. Moses, Frank C. Cummings, Arthur W. Blackman, T. K. Davis, W. H. Anders, K. H. Ways, C. Yewdall, J. B. Ramage, T. Chas. Casey, P. D. Wyman, Arthur M. Burr, Carl E. Lincoln, Lawson Ramage, J. L. Munro, Geo. W. Wise, Jr., T. C. Greene, C. J. Brown, Wm. J. McLellan, C. B. Dick, Wm. B. Livermore, Jos. A. Moses, Frank C. Cate, Frank H. Merrill, W. W. Binford, Frank McDermott, H. A. Hurlbert, R. B. Taft, John B. Van Horn, John H. Brewer, Constant Southworth, E. Lindsay Cummings, E. F. Howarth, W. N. Stetson, Jr., Fred B. Korbel, J. W. Given, S. W. Bartlett, E. D. Bement, W. T. Porter, Jr., William Ross, G. M. Graves, C. Frederick Wellington, Walter P. Simonds, Charles H. Wood, Blair B. Stringfellow, Jr., J. P. Massie, Walter L. Muzzey, Herbert N. Fowler, Leon M. Poore, Arthur C. Hall, Hubert L. Carter, N. Harrower, Charles S. Proctor, Arthur L. Hobson, Chas. W. Fields, John L. Hobson, Arthur E. Ham, R. F. Chapin, E. R. Hay, H. C. Ham, H. C. Upham, W. H. Loud, H. C. Thayer, W. G. Very, F. H. Keep, J. G. Swift, J. G. Swift, Jr., Frank H. Allen, Leon Young, J. E. Roach, Harold E. Allen, Charles W. Nelson, William H. Hitler, Arthur E. Brigham, Herbert A. Lindenberg, John J. O'Brien, E. S. Clark, E. St. George, W. E. Chase, Lionel A. Walden, Floyd H. Blackman, Charles A. Esty and George Alpert.

New Morse Roller Chain

The new Morse Roller Chain, manufactured by the Morse Chain Company Division of Borg-Warner Corporation, Ithaca, N. Y., has a distinctly different joint construction than that common to other roller chains. Within the roller there are two joint members, a segmental bushing and a pin. The cross section of the pin is that of a round pin integral with a segmental bushing.

On account of this construction, when a chain is flexing on or off a sprocket, all sliding movement of surfaces under load is between the pin and its bushing, or, specifically, no movement under load occurs between the roller and the joint members. This feature insures uniformity of pitch throughout the life of the chain, and, therefore, smoother and quieter operation.

The open spaces between the joint members provide reservoirs for oil and lubrication is made more effective by the "pumping" action when flexing. These features constitute a real advance in roller chain power transmission.

Morse Roller Chain is made to manufacturer's standards and is interchangeable on all standard roller sprockets. Bulletin R-50, which describes and illustrates the new Morse Roller Chain, will be sent upon request.

DOWNINGTOWN

EXTRACTOR ROLL

(PATENTS PENDING)

INCREASES BULK & STRENGTH OF SHEET

After the installation of a Downingtown Extractor Roll on a machine making 16 point test board, the weight of the sheet, per 1000 square feet per point of thickness, was reduced and the Mullen test increased. Another mill using sulphite screenings, for freeing up the furnish to eliminate crushing, found they could cut out 50% of the screenings and still produce the same grade of board. The Extractor Roll removes as much as 2 to 3 lbs. of water per lb. of finished board. It eliminates picking, checking and blowing and produces a firmer sheet with a better finish. The economies of the Extractor Roll in power, steam, felts and increased speed make it a sound investment. We can prove this with facts.

The Downingtown Manufacturing Co., Downingtown, Pa.

PAPER AND PAPER STOCK IMPORTS AND EXPORTS OF THE UNITED STATES

For the Month Ending July 31, and for the Seven Months Ending July 31, 1931 Compared with Corresponding Month of Previous Year

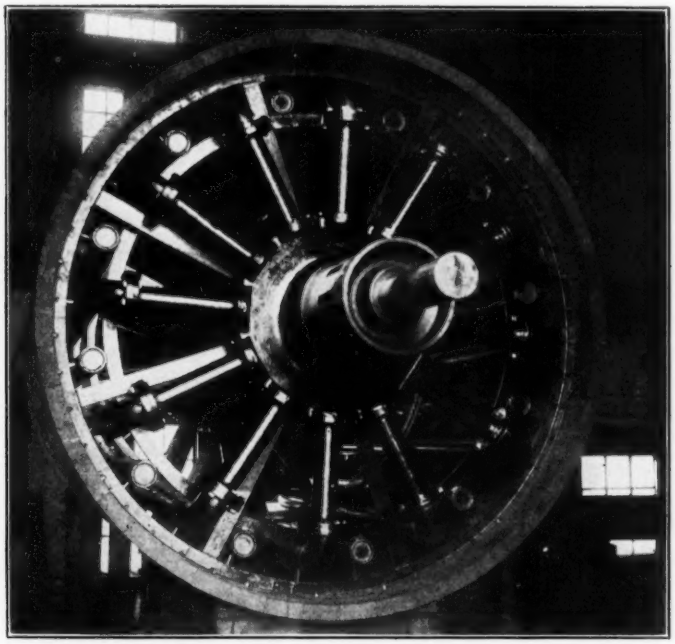
IMPORTS—PAPER

	July				Seven Months Ending July 31			
	1930		1931		1930		1931	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
PAPER AND MANUFACTURERS	.....	$12,359,117	.....	$10,246,881	.....	$87,702,027	.....	$76,342,584
Printing paper—								
Standard news print...lbs...free	387,190,182	11,166,330	346,913,621	9,325,959	2,668,816,963	77,597,869	2,446,755,165	67,662,114
Imports from:								
Finland...lbs.	5,549,301	127,503	8,422,365	173,281	51,687,360	1,193,701	53,395,984	1,197,523
Germany...lbs.	2,521,274	60,645	3,203,523	70,965	14,270,591	345,415	25,185,393	546,209
Norway...lbs.	1,539,272	35,548	786,144	18,443	9,538,035	227,732	19,024,523	483,020
Sweden...lbs.	11,207,718	287,833	10,657,361	239,794	82,011,242	2,039,199	80,567,001	1,857,277
Canada...lbs.	322,463,256	9,427,771	280,850,964	7,666,385	2,349,456,587	69,214,088	2,103,475,093	59,103,671
Newfoundland and Labrador...lbs.	43,909,361	1,227,030	42,993,264	1,157,091	161,853,148	4,577,734	165,037,199	4,472,684
All other, n. e. s...lbs...dut.	262,554	15,443	405,953	12,455	1,606,051	79,912	1,682,624	58,296
Greaseproof and waterproof papers...lbs...dut.	34,910	8,053	26,472	6,204	773,005	250,857	195,642	39,449
Kraft wrapping paper...lbs...dut.	192,047	7,203	357,129	13,858	4,807,971	190,589	2,906,072	91,700
Other wrapping paper...lbs...dut.	55,277	8,689	241,934	16,603	1,360,023	84,506	2,044,146	92,699
Writing and drawing paper...lbs...dut.	222,840	63,009	176,466	38,303	2,219,589	562,893	1,503,847	305,202
Writing paper and envelope combinations...dut.	.....	40,187	.....	29,964	.....	[2]43,055	.....	119,023
Surface-coated paper...lbs...dut.	143,442	63,514	106,614	65,300	1,234,496	495,364	670,094	326,834
Uncoated paper, decorated or embossed..lbs.dut.	9,516	3,830	20,228	5,920	[2]19,176	[2]6,774	110,758	27,304
Tissue and similar papers...lbs...dut.	.....	.....	.....	.....	[2]2,056,030	[2]1,130,184	.....	.....
Weighing not over 6 pounds to the ream...lbs...dut	145,323	84,026	108,205	64,459	[2]202,896	[2]111,649	854,462	593,216
Other...lbs...dut	54,647	19,726	26,099	9,400	[2]78,089	[2]28,662	366,706	151,053
Paper boards, n. e. s.—								
Pulp board, in rolls...lbs...dut	2,311,294	48,159	1,204,142	24,950	29,250,386	664,444	16,991,267	367,791
Paper board, pulp board, n. e. s., and card board...lbs...dut.	771,325	20,353	596,667	11,063	8,746,699	210,282	7,195,163	162,620
Leather board, test and wall board..lbs...dut.	303,032	18,733	1,238,988	50,379	1,109,934	60,605	2,051,885	89,890
Cigarette paper, cigarette books, and covers...lbs...dut.	1,053,927	341,810	858,761	203,116	7,620,359	2,594,032	14,554,578	3,774,995
Hanging paper (wall paper)...lbs...dut.	74,826	31,425	38,145	14,948	1,477,855	431,570	755,254	211,565
Duplex decalcomania paper, not printed..lbs...free	70,502	17,407	46,662	10,045	335,507	80,438	291,325	64,789
Paper boxes...dut.	.....	57,833	.....	57,961	.....	778,185	.....	551,887
Papier-mâché and pulp manufacturers, n. e. s...dut.	.....	38,490	.....	43,113	.....	358,940	.....	224,757
All other paper and manufacturers...dut.	.....	304,897	.....	242,881	.....	1,941,217	.....	1,427,400
WOOD PULP								
Mechanically ground wood pulp...tons..free	.....	.....	.....	.....	[1]128,828	[1]3,593,166	.....	.....
Unbleached...tons..free	14,967	422,413	13,521	373,643	[2]20,913	[2]595,266	92,997	2,395,861
Bleached...tons..free	378	9,249	2,305	56,731	[2]555	[2]14,232	6,937	169,023
Sulphite wood pulp—								
Unbleached...tons..free	51,176	2,628,453	46,483	1,940,790	392,165	20,144,514	303,413	13,122,419
Imports from:								
Finland...tons	7,906	395,682	7,079	309,940	55,304	2,783,325	54,595	2,203,223
Germany...tons	1,342	73,319	1,238	54,239	12,149	690,985	7,898	353,869
Norway...tons	1,560	93,723	395	22,672	14,690	823,045	5,926	264,415
Sweden...tons	25,097	1,325,876	26,494	1,094,225	192,402	10,170,196	159,601	7,077,423
Canada...tons	14,105	684,875	7,164	304,921	109,308	5,280,194	61,095	2,665,370
Bleached...tons..free	25,228	1,774,034	20,633	1,279,067	190,260	13,742,147	184,132	11,422,572
Imports from:								
Finland...tons	378	23,381	663	35,880	4,250	230,248	4,691	245,303
Germany...tons	3,340	226,834	3,129	181,818	27,349	1,958,470	27,939	1,712,021
Norway...tons	3,360	228,824	428	29,153	24,881	1,715,947	11,962	671,266
Sweden...tons	2,800	197,935	2,249	135,409	23,515	1,675,278	31,502	1,689,070
Canada...tons	14,930	1,071,286	13,516	862,856	107,864	8,010,217	103,034	6,835,780
Sulphate wood pulp—								
Unbleached (Kraft pulp)...tons..free	20,715	977,694	38,351	1,202,882	195,680	9,807,660	159,443	5,937,133
Imports from:								
Finland...tons	1,392	53,810	6,936	217,101	21,952	988,049	23,410	731,264
Norway...tons	1,192	50,141	.....	.....	7,970	371,065	2,417	82,405
Sweden...tons	13,621	593,493	29,914	900,765	119,461	5,674,288	113,471	3,815,790
Canada...tons	4,510	280,250	1,301	79,642	43,425	2,646,794	19,298	1,202,087
Bleached...tons..free	1,073	95,306	1,471	131,433	8,800	677,930	20,077	1,420,284
Imports from:								
Finland...tons	128	8,066	206	10,584	1,581	101,846	1,505	75,384
Sweden...tons	50	3,494	.....	.....	2,228	123,499	6,683	254,300
Canada...tons	785	74,171	1,265	120,849	4,272	395,255	11,721	1,082,270
Soda pulp...tons..free	231	16,265	267	14,284	[2]483	[2]33,257	2,220	120,141
Other pulp...tons..free	25	3,803	25	1,524	2,191	161,104	142	12,777
CRUDE PAPER STOCK								
Rags for paper stock...lbs...free	18,525,668	421,875	11,394,108	157,187	208,329,622	4,363,772	73,736,314	1,006,960
All other paper stock...lbs...free	28,181,962	290,442	12,026,673	133,386	162,537,150	2,240,706	69,718,502	1,031,044
CHEMICALS AND OTHER PAPER MAKERS' MATERIALS								
Colors, dyes, stains, color acids, and color bases, n. e. s...lbs...dut.	373,914	380,559	519,303	536,515	3,023,958	3,177,128	2,952,001	3,328,605
Imports from:								
Belgium...lbs.	2,204	3,046	5,209	6,631	33,229	41,158	31,266	39,365
France...lbs.	.....	.....	1,669	2,251	13,551	17,816	67,408	103,805
Germany...lbs.	246,822	271,009	286,043	287,656	2,038,188	2,166,611	1,683,306	1,811,296
Italy...lbs.	6,406	6,847	1,245	4,478	6,538	6,962	14,270	16,870
Switzerland...lbs.	100,072	85,801	212,973	228,828	847,870	868,294	1,061,794	1,256,007
United Kingdom...lbs.	6,147	7,042	1,877	2,483	48,684	48,557	60,719	68,493
China clay or kaolin...tons..dut.	8,385	91,362	16,637	127,979	145,010	1,518,662	84,610	727,392
Casein or lactarene...lbs...dut.	9,312	1,166	191,668	6,703	16,104,774	1,786,674	2,490,794	114,445

[1] Ending June 17, 1930. [2] Beginning June 18, 1930.

(Continued on page 28)

We Are Proud of the Substantial Construction of Our Units



Unretouched photograph of a saveall unit under construction in our shop.

If you have ever seen sturdier, more rigid design and construction in a machine capable of handling 4,000 gallons per minute, we invite your comments. This type of construction assures you of maximum gallons per square foot due to ample drainage and manifold construction.

FEINC SAVEALLS, DECKERS, DE-INKERS, PULP WASHERS, are gaining steadily in good repute due in no small measure to their construction as shown above.

"THE FILTER WITH THE STRINGS"

WRITE US FOR FURTHER INFORMATION

CANADA

WATT MACHINERY & EQUIPMENT CO.
MONTREAL, QUE.

NORTHERN FOUNDRY & MACHINE CO.
SAULT STE. MARIE, ONT.

W. J. WESTAWAY CO. LTD.
HAMILTON AND MONTREAL
(Sewage Disposal)

FILTRATION ENGINEERS INCORPORATED
FE
SERVICE ECONOMY

General Offices and Plant
NEWARK, N. J.
Cable Address "FEINC—NEWARKNEWJERSEY"

NEWARK, NEW JERSEY
858 SUMMER AVE.

PORTLAND, OREGON
355 EVERETT ST.

EUROPE

MACHINENFABRIK IMPERIAL
G. M. B. H.
MEISSEN, GERMANY

PAPER AND PAPER STOCK IMPORTS AND EXPORTS OF THE UNITED STATES

(Continued from page 26)

EXPORTS—PAPER

	July 1930 Quantity	July 1930 Value	July 1931 Quantity	July 1931 Value	Seven Months Ending July 31 1930 Quantity	Seven Months Ending July 31 1930 Value	Seven Months Ending July 31 1931 Quantity	Seven Months Ending July 31 1931 Value
PAPER AND MANUFACTURERS	.....	$2,411,967	.....	$1,932,910	.....	$19,134,056	.....	$14,058,775
Printing paper—								
News print paper ..... lbs.	1,261,917	49,184	1,098,206	35,013	13,448,267	548,502	9,649,252	324,980
Book paper, not coated ..... lbs.	1,918,657	129,924	1,573,920	92,891	21,524,900	1,455,765	11,094,636	706,204
Exports to:								
Europe ..... lbs.	68,222	6,870	3,472	486	457,206	42,263	181,999	15,732
Canada ..... lbs.	828,080	49,487	596,835	31,667	6,307,413	391,334	2,831,855	164,196
Mexico ..... lbs.	42,237	4,344	16,483	1,678	444,745	48,061	238,250	24,519
Cuba ..... lbs.	391,492	26,189	101,890	7,081	2,746,311	188,194	1,449,223	95,350
Argentina ..... lbs.	225,304	15,476	140,917	7,054	1,028,911	74,821	767,174	45,424
Other South America ..... lbs.	183,746	13,610	118,104	8,583	1,235,815	95,412	809,835	58,018
China, Hong Kong, and Kwantung ..... lbs.	4,800	544	324,387	17,556	4,505,774	276,116	1,514,997	83,936
Philippine Islands ..... lbs.	56,527	4,237	94,684	5,356	2,449,253	158,731	1,562,866	100,699
Australia ..... lbs.	5,136	688	38,892	2,213	563,335	43,574	745,502	41,708
Cover paper ..... lbs.	160,619	25,180	179,344	25,008	1,406,900	224,920	1,084,293	162,792
Greaseproof and waterproof paper ..... lbs.	365,639	64,040	336,259	79,222	2,062,120	398,182	2,859,454	567,716
Overissue and old newspapers ..... lbs.	11,863,479	90,569	23,916,404	175,298	95,735,413	807,786	116,827,465	854,404
Wrapping paper ..... lbs.	3,911,018	222,456	1,925,361	116,165	27,496,558	1,726,737	18,065,212	990,541
Surface-coated paper ..... lbs.	647,644	78,302	414,959	53,805	5,625,054	621,688	3,422,379	384,179
Tissue and crepe paper ..... lbs.	389,279	87,420	207,558	38,196	2,953,210	568,670	1,882,761	307,440
Toilet paper ..... lbs.	512,550	55,057	624,080	63,727	4,465,251	485,187	4,526,441	479,982
Paper towels and napkins ..... lbs.	444,457	45,591	284,844	26,552	2,498,288	278,168	2,152,374	208,546
Boxboard (paperboard and strawboard) ..... lbs.	6,081,849	151,281	4,286,801	96,444	41,547,847	1,022,080	34,916,480	816,180
Bristols and bristol board ..... lbs.	201,197	16,833	109,402	9,531	1,409,672	130,207	1,086,395	108,608
Other paper board ..... lbs.	2,921,097	135,730	3,542,406	120,092	22,522,029	1,076,893	27,189,128	966,711
Sheathing and building paper ..... lbs.	1,489,446	48,128	1,396,724	34,053	11,715,577	408,000	10,648,323	308,709
Fiber insulating lath or board ..... sq. ft.	4,843,641	160,090	3,652,821	128,513	39,644,667	1,261,205	24,677,016	785,986
Wall board of paper or pulp ..... sq. ft.	2,433,438	90,665	1,170,727	40,840	18,050,981	595,726	11,252,574	360,316
Blotting paper ..... lbs.	279,249	36,230	113,160	16,965	1,556,063	233,476	1,344,198	151,828
Filing folders, index cards, and other office forms ..... lbs.	100,902	40,478	130,268	36,225	943,973	365,503	872,876	278,411
Papeteries (fancy writing paper) ..... lbs.	55,084	11,296	19,279	4,758	361,857	77,536	170,284	42,564
Other writing paper ..... lbs.	1,633,512	155,142	1,550,269	118,327	15,557,410	1,341,457	8,985,071	846,822
Paper hangings (wall paper) ..... rolls	95,232	16,764	62,368	7,551	2,159,949	334,121	2,164,515	248,456
Paper bags ..... lbs.	927,814	68,224	934,063	66,163	5,748,461	482,588	7,245,709	515,878
Boxes and cartons ..... lbs.	2,500,953	125,492	1,381,405	85,862	15,177,708	858,499	8,943,363	580,677
Envelopes ..... lbs.	160,009	26,287	107,877	17,126	1,376,906	225,573	996,828	151,379
Vulcanized fiber sheets, strips, rods, and tubes ..... lbs.	432,261	102,475	360,670	94,491	2,839,892	698,487	1,968,838	511,086
Cash-register and adding-machine paper ..... lbs.	426,776	39,141	1,184,146	88,395	3,331,546	297,593	5,176,346	410,082
Other paper and paper products	.....	339,988	.....	261,697	.....	2,609,507	.....	1,988,298
WOOD PULP AND PAPER STOCK								
Sulphite wood pulp ..... tons	1,804	95,594	4,414	259,072	18,689	1,026,557	23,292	1,146,012
Soda wood pulp ..... tons	121	9,931	172	13,480	1,534	119,267	855	63,469
Other wood pulp ..... tons	1,826	39,745	425	12,859	6,196	218,912	1,245	44,237
Rags and other paper stock ..... lbs.	6,630,926	82,950	5,494,669	60,893	38,046,410	562,101	36,557,634	407,025
PAPER AND PULP MILL MACHINERY								
Paper and pulp mill machinery	.....	345,342	.....	99,783	.....	1,943,187	.....	858,079

News of the Toronto Paper Trade

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., November 23, 1931—A crepe paper instruction service has just been instituted by Interlake Tissue Mills, Ltd., at Merritton, Ont., consisting of a series of instructions which have been written and illustrated with great care. The object is to facilitate a more practical understanding of the uses of crepe paper as it applies to the varied fields in which it is increasingly finding a place. The series covers the fields of window-dressing, flower-making and decoration of homes, booths, halls, etc. The papers, which have been written by experts, are all copyrighted.

J. I. Jartt, of Orillia, Ont., Inspector of Crown Timber Agencies for Ontario, has completed a survey of conditions and outlook in Northern Ontario in the pulp and lumber industries. He reports that recently the paper manufacturers discovered that the demand for news print was somewhat better and prospects brighter, so they decided it would not be wise to let the stock of pulpwood run down to the last stick before replenishing the reserves. One large company gave orders to the settlers within their territory for pulpwood which will keep them busy all winter. The price is not cut and will give good returns for labor and wood. Another firm is putting in camps and will take out quite large supplies.

Dr. A. F. Gallaugher, of Montreal, and formerly of Vancouver, has been appointed in charge of the mill laboratory which Interlake Tissue Mills at Merritton, Ont., recently organized. Dr. Gallaugher recently completed an advanced course of research work at the Pulp and Paper Institute in Montreal.

Donald C. Kelso, formerly of the Fort William Paper Company, Fort William, Ont., and now of the Mersey Paper Company at Liverpool, N. S., is receiving the congratulations of many friends on the arrival in his family of a young son.

N. B. Powter, of the advertising department of the Howard Smith Paper Mills, has returned to Toronto from Montreal where he had charge of the company's exhibit at the Produced-in-Canada exhibition.

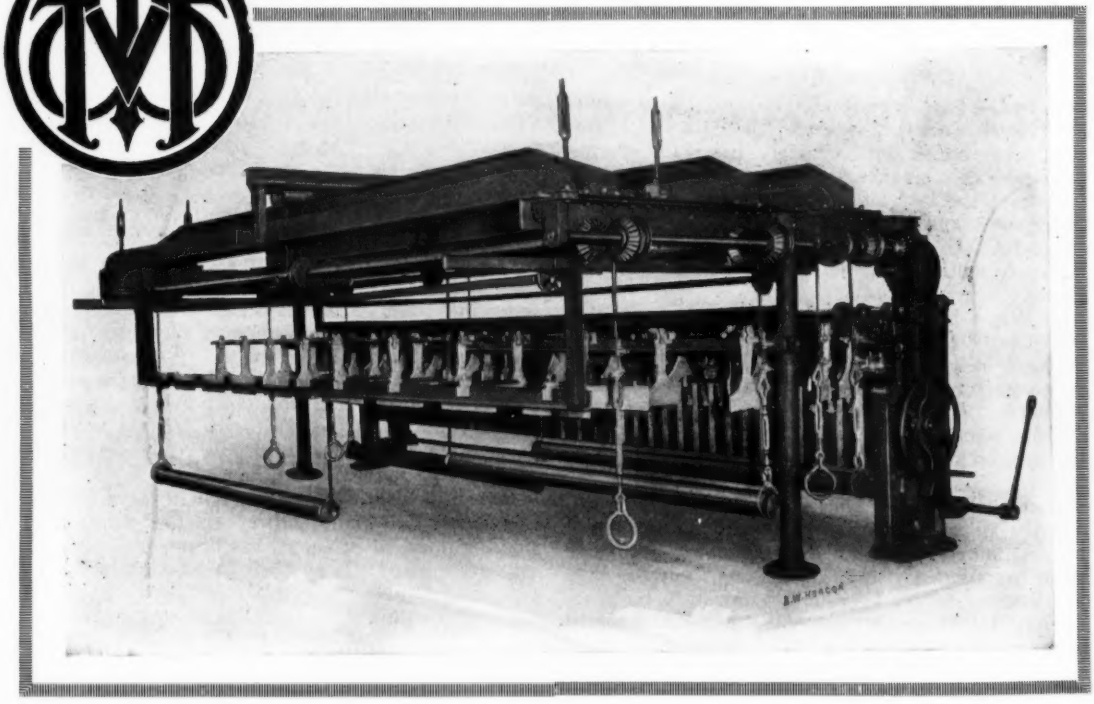
R. B. Hall, manager of the Toronto office of the Howard Smith Paper Mills, has returned to Toronto after a business trip to Montreal.

New Canadian International Vice-President

At a recent meeting of the board of directors of Canadian International Paper Company, Brig. Gen. J. B. White, D.S.O., was appointed first vice-president. Brig. Gen. White is vice-president of the New Brunswick International Paper Company, vice-president of Gatineau Power Company, and a director of Canadian Hydro-Electric Corporation, Ltd.

222" 9-PILE
M. & W. DUPLEX LAY BOY

Built for
Southern Kraft Corp.
PANAMA CITY, FLORIDA



Enlarging a "Bottle Neck"

WHERE sheets from a paper cutter are piled by hand, the limiting factors in the machine's output are the dexterity of the girl at the laying table, and the time that cutter is actually operated. Not only does the girl slow down the cutter when paper is running badly; but when she is tired the sheets are badly laid and sometimes must be scrapped. Also, it is necessary to shut down the unit periodically to remove paper from the pile, which when hand laid is only 9 inches high.

By putting Moore & White Lay Boys to work on your cutters, not only will you save a large part of the wages paid for a purely mechanical operation, but you will enhance the returns from your investment in the cutters.

Spoilage will be less.

Cutters can be operated more continuously, thus increasing total production.

Can be attached to any make of cutter.

Use them for waxed glazed and curly papers.

Write us for further details.

"M & W" Equipment Is Always Dependable In All Ways

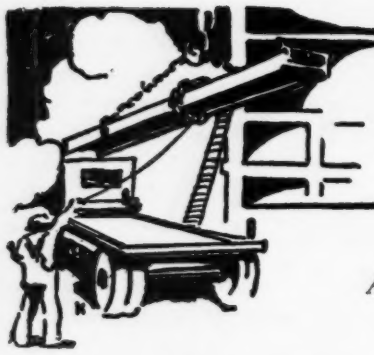
Economically the Need of the Day in Your Mill

THE MOORE & WHITE COMPANY

Established 1885

PAPER MACHINE BUILDERS

15TH ST. & LEHIGH AVE. PHILADELPHIA, PA.



CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Elkhart, Ind.—The Illinois Carton and Label Company, 2601 North Crawford Avenue, Chicago, Ill., manufacturer of paper boxes and containers, has plans nearing completion and will soon take bids on general contract for a new plant unit at Clark and Elkhart streets, Elkhart, to be one-story, saw-tooth roof type, 130 x 200 feet, reported to cost over $60,000, with equipment. Large increase in present capacity will be arranged. A. B. Jennings is general manager.

De Pere, Wis.—In connection with proposed rebuilding of mill of the De Pere Paper Manufacturing Company, West De Pere, referred to recently in these columns, it is said that company will expend over $200,000, on plant and machinery. The unit will replace a structure destroyed by fire some time ago. It is understood that work will soon begin on superstructure. Herman Miller is general manager.

New Brunswick, N. J.—The Empire Box Company, South Bend, Ind., manufacturer of paper and cardboard boxes and containers, is said to be arranging for early operation at proposed new branch plant on Codwise Avenue, New Brunswick, N. J., where a one-story building, totaling about 30,000 square feet of floor space, recently was secured. Large capacity will be developed. It is understood that company headquarters will be continued at South Bend, as heretofore. Stanley J. Klein is president.

Buffalo, N. Y.—The Lee Paper Specialties Company, Inc., 25 River street, is maintaining operations at close to normal production. Recent inquiries have increased in volume, and company anticipates early employment of additional workers at the plant. Lee A. Irish is president.

San Antonio, Tex.—The Carpenter Envelope Company of Texas, Inc., lately organized by A. S. MacLaren and associates, San Antonio, to operate a paper converting plant, has leased portion of building at 301 South Flores street, for initial factory. Company will make improvements and alterations, and will install from fifteen to twenty envelope machines and auxiliary equipment, providing for a capacity of about 500,000 envelopes per day. Estimated cost has not been announced. It is proposed to begin operations at an early date.

Plattsburg, N. Y.—The Saranac Pulp & Paper Company, Inc., is holding to a capacity schedule at its local tissue mill, giving employment to a full working quota on a three-shift production basis in 24-hour period. It is proposed to hold to that schedule for an indefinite period.

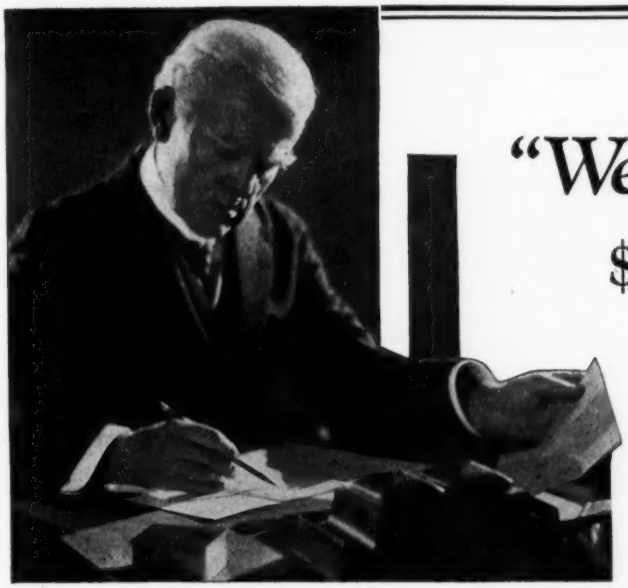
Newark, N. J.—The Novelty Case Manufacturing Company, recently organized with capital of $10,000, will take over and expand company of same name with local plant at 101 Peddie street, specializing in the manufacture of paper and cardboard boxes and containers. Company officials have also organized another company under the name of the Duroboard Products Company, Inc., with similar capital of $10,000, to manufacture paper board specialties. It is understood that last noted organization will maintain headquarters at the Peddie street factory.

Whippany, N. J.—The Agar Manufacturing Company, Whippany, manufacturer of corrugated paper products, is running on a part-time production schedule, after maintaining close to full operations for about eighteen months past. The curtailed basis will be continued for an indefinite time. Company has also announced a wage reduction of 15 per cent, making the third cut since July.

Wausau, Wis.—The Marathon Paper Mills Company, Menasha, Wis., will push construction on a new one-story basement mill addition, for which general contract recently was let, estimated to cost close to $25,000, with equipment. It is proposed to have the unit ready for service at an early date.

San Francisco, Cal.—The Armstrong Cork Company, Lancaster, Pa., manufacturer of sheet cork, cork insulation and kindred products, has begun preliminary work on improvement of site at Shell Point, Contra Costa County, near San Francisco, recently acquired for a new plant. Contract for this work has been let to Lindgren & Swinerton, Inc., 225 Bush street, San Francisco. Plans are said to be nearing completion for a group of buildings for initial plant, including power house, pumping plant and other mechanical units. Entire project is reported to cost over $1,000,000, with equipment. Henry Boettcher, Lancaster, is company engineer.

Canton, N. C.—The Champion Fibre Company, Canton, has awarded a general contract to the Morton C. Tuttle Company, 31 St. James street, Boston, Mass., for three new buildings at its local plant, included in an expansion and improvement program, recently referred to in these columns. The largest unit will be one-story, 110 x 352 feet, and will be used for a machine department, with installation of a paper-making machine now being built by the Pusey & Jones Corporation, Wilmington, Del., with auxiliary paper-making equipment; a four-story beater building, 110 x 120 feet, to be equipped with new machinery; and a three-story finishing department, 126 x 208 feet. All units will be of concrete, with steel superstructure. Work will be placed under way immediately. The expansion will provide for an increase of about 70 tons of finished stock a day, and is reported to cost over $1,500,000. Company is placing additional contracts for equipment and further awards will be made at an early date, or as the work progresses. A contract for filters has been let to the Lynchburg Foundry Company, Inc., Lynchburg, Va., while an order for winders has been placed with the Moore & White Company, Philadelphia, Pa. Reuben B. Robertson is president.



MORE BANKER PROOF EVIDENCE
No. 5 of a series of actual mill reports
Watch for the others

"We'll save $9,467.05 by installing that TENSILASTIC"

Let's step behind the curtain of a New York State mill making news and catalogue on a two-press machine. This mill had used *ordinary* rubber press rolls for years. Encountered all the usual roll "headaches"... accepted them as normal, "best-we-can-do-under-the-circumstances", —charged them up to "cost-of-production",— as many mills still do.

THEN THEY CHANGED TO TENSILASTICS!

And changed their entire conception of rubber roll performance. We told them Tensilastics would perform *better* than any rubber rolls they had ever used,—a *safe, sincere* promise, because Tensilastics are built that way. But the detail that looms up biggest in these pinched-profit days was the money saving shown by Tensilastics.

Here's an excerpt from a recent report...

> "Tensilastic rolls are running from 7 to 8 weeks, with one run of 11 weeks, against average of 2 to 3 weeks grinding over a period of years. Weight heavy,—using four 50 lb. weights on side."

Carry those figures through to their logical conclusion and you'll find this comparison:

ORDINARY RUBBER PRESS ROLL

6 replacements in 15 years at $820	$4,920.00
Interest, $4,920 at 6% (mean of 7½ years)	2,214.00
Grinding every 3 weeks at $20	5,199.00
Interest, $5,199 at 6% (mean of 7½ years)	2,339.55
	$14,672.55

TENSILASTIC RUBBER PRESS ROLL

2 rolls in 15 years at $820	$1,640.00
Interest, $1,640 at 6% (mean of 7½ years)	738.00
Grinding every 2 months at $20	1,950.00
Interest, $1,950 at 6% (mean of 7½ years)	877.50
	$5,205.50

$9,467.05 actually saved by Tensilastics. If you doubt these figures, let your banker check them.

Tensilastics show amazingly longer life between grindings; remarkable resistance against oxidation, deterioration, distortion, corrugation, wear and abuse. Their tensile strength, after three years of use, is higher than the original tensile of ordinary rolls. Their density can be controlled within the closest limits ever achieved.

Let your next rubber roll order—whether press, table, breast, couch, wire or carrier,— be TENSILASTICS. Check their performance,—and write your own Banker Proof savings.

Write for copies of
"The USE AND ABUSE of RUBBER ROLLS"
"DENSITY and CROWNING of PRESS ROLLS"
"TENSILASTIC and WHAT IT MEANS"

American Wringer Co., Inc.

Rubber Roll Specialists for More Than 40 Years

Woonsocket, R. I. Farnham, Quebec

33 No. La Salle St., Chicago — Pacific Coast Representative: Walter S. Hodges, Lewis Bldg., Portland, Ore. — 461 Eighth Ave., New York

TENSILASTIC RUBBER ROLLS

T23

New York Trade Jottings

Frost-White Paper Mills has been chartered under the laws of the State of New York with a capital stock of $25,000. The attorneys are the Albany Service Company, 299 Broadway, New York.

* * *

The Eaton-Dikeman Company, of 537 Pearl street, is moving its office and warehouse to 155 Sixth Avenue, New York. Additional floor space will accommodate a larger stock of blotting papers and the location will permit quicker deliveries to the trade.

* * *

The Waste Paper Institute held a very successful conference at the Hotel Astor last week. Paul J. White, of the Gatti Paper Stock Corporation, New York, and Joseph Benedetto, of D. Benedetto, Inc., New York, were elected to the executive committee to fill vacancies.

* * *

Henry D. Schmidt, president of the Schmidt & Ault Paper Company, of York, Pa., was elected president of the Paperboard Industries Association at the annual meeting in New York last week, succeeding J. H. McLeod, of the Hinde & Dauch Paper Company, of Sandusky, Ohio.

* * *

Frank E. Skrivanic, representing the Western Paper Converting Company, converters of all kinds of paper specialties, of Salem, Ore., has been surveying the eastern territory, attending business conferences and gleaning new ideas during the last several months and was a New York visitor last week.

* * *

T. O. Klath, U. S. Commercial Attache at Stockholm, Sweden, was the guest speaker at the regular weekly luncheon and meeting of the Eastern Division of the Salesmen's Association of the Paper Industry, at George's Restaurant, New York, last Tuesday. Mr. Klath discussed the present situation in Sweden and other Scandinavian countries in an interesting and instructive manner and his address was greatly appreciated by all present.

* * *

International Paper and Power Company, New York, report net revenue for the third quarter of $10,720,409, compared with $9,724,119 in the third quarter of last year. After deducting depreciation, interest, dividends on preferred and minority common stocks of subsidiaries and all other prior charges, the balance added to surplus in the third quarter was $264,297, compared with $974,874 in the corresponding quarter a year ago. For the first nine months net revenue was $31,203,867 against $30,471,610 for the first nine months of last year, and balance added to surplus was $1,871,294, compared with $2,245,985 in the corresponding period of 1930.

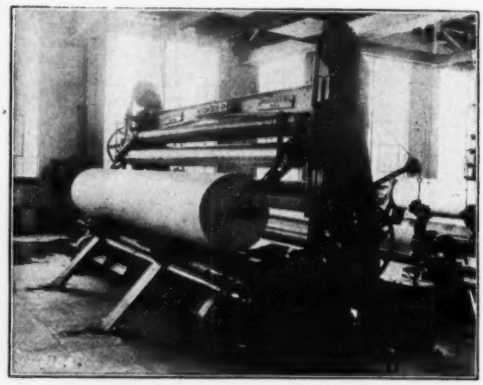
TAPPI Lake States Division Meets

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 16, 1931—Every paper mill in Wisconsin and some from other sections were represented at the monthly dinner of the Lakes States Division of the Technical Association of the Pulp and Paper Industry at Appleton last week. More than one hundred attended. "Cleaner Paper with Cooper Pipe," was the subject presented by L. M. Young, of the Mueller Brass Company, Port Huron, Mich. Another talk on "Lubrication in Pulp and Paper Mills" was given by J. W. Grimes, of the Standard Oil Company of Indiana, Chicago.

Glatfelter Installs New Winder

Visitors to the Glatfelter Mill at Spring Grove, Pa., are always impressed by the neat workman-like appearance of this mill and one thing that contributes to this appearance is the installation of a new CAMACHINE Type 19 winder 177" wide as shown in the illustration.



NEW CAMACHINE WINDER

This type machine has made quite an impression on paper mill officials since the first model was built some years ago when the Great Northern Paper Company purchased 16 for their various mills. Other recent installations include 6 for the Ontario Paper Company at Thorold, Canada and 3 at the mills of J. R. Booth, Ltd., Ottawa, Canada.

TAPPI Annual Meeting

A tentative program has been announced by the Finishing, Processing and Converting Committee, of which J. J. O'Connor of the Mead Corporation, Chillicothe, Ohio, is chairman, for its meeting during the annual convention of the Technical Association of the Pulp and Paper Industry, Pennsylvania Hotel, New York, February 15-18, 1932.

H. G. Rappolt, of the John Waldron Corporation, will read a paper entitled "The Mechanical Handling and Drying of Single Coated Paper." Harold Rafton, of the Raffold Process Corporation, will read a paper on "Some Observations on Paper Coated on a Double Coater." E. O. Whittier of the Bureau of Dairy Industry, Washington, D. C., will discuss "The Value of Laboratory Tests of Casein." There will be a number of reports by subcommittees on new developments in the coating industry relative to machinery, materials and grades of paper.

Crystal Tissue Co. Report

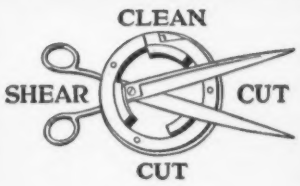
[FROM OUR REGULAR CORRESPONDENT]

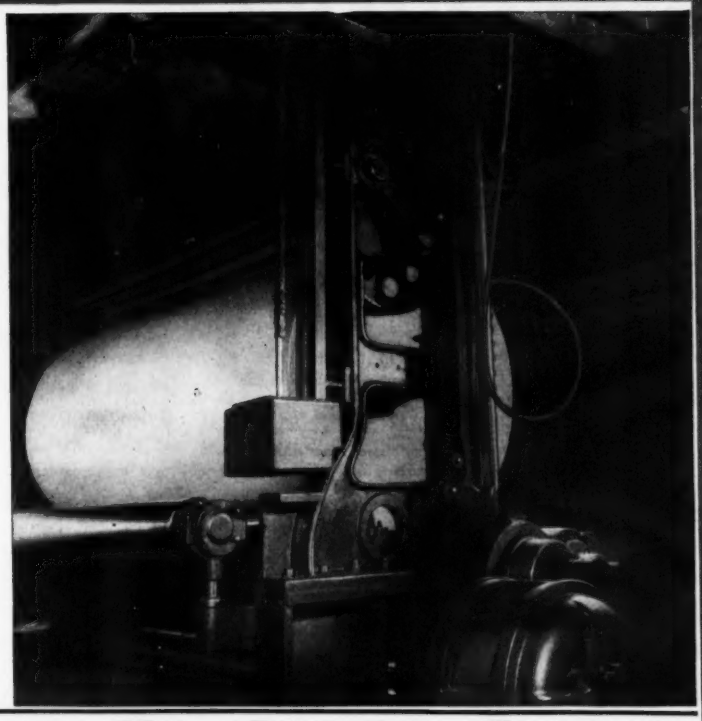
DAYTON, Ohio, November 23, 1931.—Net earnings of the Crystal Tissue Company, Middletown, Ohio, for the nine months ended September 30, after charges and taxes, amounted to $61,193, or 53 cents a share on 93,000 shares of common stock after dividend provisions on the preferred stock.

This compares with a net in the corresponding period of 1930 of $116,573 or $1.12 a share after preferred dividends.

The balance sheet as of September 30 lists total assets of $354,507; total current liabilities of $134,801, and total assets of $1,349,517. The earned surplus item amounted to $324,716.

a clean cut ~ a sure cut ~ a shear cut ~





LANGSTON
Slitters & Rewinders

OPERATING records, collected and analyzed by impartial surveyors, show conclusively that Langston Slitters and Rewinders are highly profitable. And why not? These machines are the product of over thirty years' experience. They contain elements of design, workmanship and materials that are time-tested. High speeds, of course—yet at no sacrifice of quality rolls. The Shear-Cut principle continues to produce those firm, square-edged, *dust-free* rolls such as no other method can match. Manufacturers and converters realize the necessity of reducing production, maintenance and labor costs; at the same time improving the quality of their product. Such firms will find it to their interest to learn what fact records prove Langston's have done on these points.

SAMUEL M. LANGSTON COMPANY
Camden, New Jersey

a shear cut ~ a clean cut ~ a sure cut ~ a shear cut ~

a clean cut ~ a sure cut ~ a shear cut ~

PAPER TRADE JOURNAL
ESTABLISHED 1872

Published at 34 North Crystal St., East Stroudsburg, Pa. Executive and Editorial Offices, 10 East 39th St., New York, N. Y.

Henry J. Berger
Editor

Ronald G. Macdonald
Editor Technical Section

Herbert J. Laughton
Associate Editor

Thomas J. Burke, C. A.
Editor Cost Section

Reginald Trautschold, M. E.,
Power Engineering Consultant

Lynne M. Lamm, *Washington Correspondent*

Price. Per Copy, 10 Cents
United States, Per Annum, $4.00
Canada and Foreign Countries in Postal Union, $6.00

Member Audit Bureau of Circulations

Vol. XCIII New York, November 26, 1931 No. 22

FOREIGN PAPER TRADE

According to preliminary figures United States exports of paper and paper products during the first nine months of 1931 reached a value to $17,373,527, or a decrease of 27 per cent over the corresponding period last year according to the Paper Division of the Department of Commerce. Exports of cash register and adding machine paper registered the highest increase during this period, amounting to $511,412 which was an increase of 52 per cent over the same period last year, followed by greaseproof and waterproof papers, which totaled $755,122, or an increase of 40 per cent. A favorable showing was also made by overissue and old newspapers the exports of which amounted to $1,142,567, or an increase of 13 per cent.

The exports of all other commodities in the paper and paper products group declined during this period as compared with the same period last year, with papeteries heading the list with a 52 per cent decrease. This was followed by book paper, not coated, which registered a loss of 48 per cent, our exports of this commodity to Europe declining 80 per cent, to Canada, 60 per cent, to Mexico, 52 per cent, to China, Hong Kong and Kwantung, 50 per cent, to Cuba, 45 per cent, to other South American points, 38 per cent, to the Philippine Islands, 34 per cent and to Australia 12 per cent.

Decreases of from 35 to 40 per cent occurred in our exports of the following during this period: News print, surface coated papers, box board, fiber insulating lath or board, wall board of paper or pulp, blotting paper, other writing paper, boxes and cartons and envelopes, while decreases from 25 to 30 per cent were shown in our exports of sheathing and building paper, cover paper, paper towels and napkins, filing folders, index cards and other office forms, vulcanized fiber, sheets, strips, rods and tubes and paper hangings. Tissue and crepe paper and wrapping paper were also among the heavier losers, being 46 and 43 per cent, respectively lower than last year in the first nine months period, while only slight decreases occurred in our exports of paper bags, other paper board, toilet paper and bristols and bristol board.

September shipments of the following were considerably higher than in the preceding month: Paper bags, cover paper, overissue and old newspapers, surface coated papers, tissue and coated papers, toilet paper, paper towels and napkins, fiber insulating lath or board and of vulcanized fiber sheets, strips, rods and tubes.

Exports of paper base stocks during the first nine-month period were valued to $2,833,969, or a decrease of 18 per cent over the same period last year. Exports of sulphite wood pulp totaled $1,602,456, or a decrease of 35 per cent, while soda pulp showed a loss of 45 per cent, other wood pulp, 78 per cent, and rags and other paper stock 18 per cent.

Imports of paper and paper products during the first nine-month period totaled $95,290,102, or a decrease of 13 per cent. Standard news print, which accounted for $84,569,269 of this total was also 13 per cent below last year's record for the first nine months, our imports of this commodity showing an increase of 58 per cent from Germany, while decreasing from Canada by over $13,000,000, cigarette paper, cigarette books and covers registered an increase of 40 per cent during the period under review, totaling $4,367,908.

With the exception of leather board, test board and wall board, which showed an increase of 27 per cent and other wrapping paper, the imports of which were 13 per cent higher, all other imports of paper and paper products declined and very heavily in the case of greaseproof and waterproof papers, Kraft wrapping paper, writing and drawing paper, pulp board in rolls, hanging paper, (wall paper), and paper boxes.

Imports of paper base stocks during the first nine-month period reached a total valuation of $56,168,512, or a decrease of 32 per cent when compared with the same period in 1930. Imports of pulpwoods were 35 per cent lower, of sulphite wood pulp, unbleached, 45 per cent, bleached 16 per cent; sulphate wood pulp, unbleached, 35 per cent, while sulphate wood pulp, bleached, showed an increase of 87 per cent.

WORK OF THE PAPER DIVISION

The year 1930-1931 was marked by depression in the paper industry, and both production and consumption of paper and paper goods showed a decrease, says F. M. Feiker, Director of the Bureau of Foreign and Domestic Commerce in his annual report to the Secretary of Commerce. Commenting on the work of the Paper Division during the past fiscal year Mr. Feiker says:

"Competition in all lines was noticeably strong, since exports of paper and paper products as a whole decreased

by about 18 per cent in value. This drop was accounted for largely by the fact that our exports included increased quantities of paper products of lower value, actual volume being estimated to have decreased by only about 6 per cent as compared with the previous year.

"Active assistance was rendered by the paper division to manufacturers of all lines of paper and board as well as of printing machinery and supplies, and full information was furnished them, either in published material or in correspondence, regarding economic conditions affecting markets for their products The actual number of services performed for exporters in connection with markets during the year was 33,275, an increase of slightly more than 1 per cent over last year. A greater number of these, however, concerned new markets for paper-specialty lines. Market investigations were made on behalf of firms manufacturing tissue papers and varied lines of writings and papeteries, while printing-equipment concerns were assisted in finding outlets and representatives abroad.

"Cooperation with the industry through the trade associations has been continued on an increased scale. A special statistical survey of the world's international pulp trade was completed, as was also a portion of a similar work in connection with finished paper. The preliminary work on a manual or glossary of paper terms and designations in six languages as used in international trade was completed and sent abroad for final revision and correction. The addition of one member to the staff of the division during the year has permitted the completion of several important pieces of work concerning the market and industrial situation abroad that heretofore could not be adequately handled."

Boston Paper Market Steady

BOSTON, Mass., November 23, 1931—With the market holding recent gains, paper distributors in and around the Hub are in a generally hopeful vein. Wholesalers of both fine and wrapping paper are looking forward to further orders to come, some of which are seasonal. In fine paper, stocks of manufacturers, jobbers, printers and consumers are all reported to be low, so that the market is apparently in a healthy condition. Local concerns are doing and planning more direct mail advertising than for a considerable period. The wrapping paper market continues fairly active, although buyers are placing their orders on a hand-to-mouth basis. The department stores, it is stated, are yet to purchase for holiday purposes. Paper specialties and paper board specialties are moving well. While the box board business has dropped off somewhat during November so far, a persistent demand for clay-coated board is noted.

The paper stock market continues very quiet generally, with a descending trend still prevailing in practically all grades. No. 1 mixed paper and old newspapers have taken further declines, with the former now quotable at .20 @ .25, compared with a previous range of .22½ @ .32½, and the latter at .27½ @ .35, against .30 @ .37½. White blank news is down to 1.50 @ 1.60 from 1.57½ @ 1.65. Corrugated news has declined to .35 @ .45 from .37½ @ .47½. Some further changes have taken place in foreign rags, including new No. 1 white shirt cuttings which have dropped from a range of 6.50 @ 6.75 to a flat price of 5.25.

TAPPI Notes

E. K. Mansfield who until recently has been production manager for Robert Gair Company is now at South Windham, Maine with the Androscoggin Pulp Company.

Norman Clark, formerly coated paper mill superintendent at the Standard Paper Manufacturing Company is located at 4005 Northrop street, Richmond, Virginia. Mr. Clark is interested in obtaining a position in a coated paper mill.

William Gregor, formerly superintendent of the Newton Falls Paper Company is now with E. B. Eddy Company, Hull, P. Q.

H. T. Baker, who has been engineer for the past eight years in the consulting engineering office of H. S. Taylor, Dayton, Ohio, is at present unemployed due to the closing of this office and may be reached at 270 Delaware avenue, Dayton, Ohio.

Farnsworth Company, heat reclamation engineers, have moved from Conshohocken, Pennsylvania, to Watertown, N. Y. All the equipment of this company will be made for it by Bagley & Sewall.

The annual meeting of the A. S. M. E. will be held in New York from November 30th to December 4, 1931.

Anyone experienced in operating or technical work in the industry and at present unemployed should register with the Technical Association of the Pulp and Paper Industry, 370 Lexington avenue, New York. Companies seeking employes should also communicate with the Association. No fees are charged for the services rendered.

The I. H. Weldon gold medal will again be presented to the member of the Canadian Technical Section who presents the best paper at its annual meeting in January. The points taken into account by the judges are first, the practical value of the paper in its application to the pulp and paper industry, second, the amount of study and research shown in its preparation and third, its composition and literary merit. This medal is presented annually by A. L. Dawe and has a stimulating effect on the quality of papers presented. A similar type of award would be helpful to the TAPPI meetings. This is an opportunity for someone to effectively serve the Association and the American paper industry.

The advisory committees representing the National Research Council Preservation of Records and the Standardization Committee of Lithographic Papers will attend a meeting at the Bureau of Standards, in Washington, D. C. November 30th and December 1st. At this meeting the Bureau will report on its research projects and will give demonstrations of paper making and also of laboratory work.

Paper Mill Employment

Three hundred and eighty-five paper and pulp mills reported their August employment to the Bureau of Labor Statistics, Department of Labor to have been 80,172 decreasing in September to 78,470, a decrease of 2.1 per cent. Weekly payrolls in these identical mills also decreased from $1,811,235 in August to $1,673,987 in September, a decrease of 7.6 per cent.

Reports were received by the Bureau from 300 paper box factories who gave their August employment at 23,108 increasing in September to 23,683, an increase of 2.5 per cent. The weekly payrolls in these factories, however, decreased from $486,889 in August to $485,566 in September, a decrease of 0.3 per cent.

WATCHFUL SERVICE

Machining anodes . . . a step in the regular rebuilding of EBG cells.

EBG

EBG Liquid Chlorine has a place in industries where dramatic changes are occurring. The advance of chemical prowess makes yesterday's new methods obsolete today. And the EBG organization keeps its product and its service apace . . . with a laboratory, an engineering department, and a thoroughgoing service staff.

ELECTRO BLEACHING GAS CO.

Pioneer Manufacturers of Liquid Chlorine

Main Office: 9 E. 41st St., New York, N. Y. Plant: Niagara Falls, N. Y.

Liquid Chlorine

Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Analysis of Formaldehyde

Tentative Official Standard Method of the Technical Association of the Pulp and Paper Industry

Formaldehyde is a gaseous substance with the chemical formula HCHO. It is used in aqueous solution as a disinfectant, insecticide and deodorizer. It is commonly used in the paper industry as a glue preservative, about 1 gallon of formaldehyde solution to 1000 gallons of glue solution being common practice. In larger amounts it renders both glue and casein insoluble. It therefore finds a use in waterproof coatings. Equal volumes of strong formaldehyde solution and of strong ammonium hydroxide (26°Be) form hexamethylenetetramine, commonly called "hexa." When this is added to a solution of glue or casein, they do not become insoluable without the application of heat. Formaldehyde solution polymerizes readily to the paraldehyde and usually contains more or less methyl alcohol to prevent this. The U.S.P. solution should contain not less than 37 per cent by weight of HCHO.

It is usually only necessary to determine the strength or formaldehyde content.

Reagents

(1) Normal solution of NaOH.
(2) Normal solution of HCl or H_2SO_4.
(3) Hydrogen peroxide, approximately 3 per cent solution, neutral to litmus. The regular hydrogen peroxide obtained in drug stores is usually satisfactory. If acid, it must be neutralized to litmus with the NaOH solution before using.
(4) A solution of purified litmus of sufficient strength so that 3 drops will impart a distinct blue color to 50 cc. of water.

Procedure

50 cc. of the normal NaOH shall be pipetted into an Erlenmeyer flask, followed by 50 cc. of the H_2O_2 solution. Then from a weighing pipette 3 cc. of the formaldehyde solution shall be added, letting the point of the pipette reach nearly to the liquid. The weight of the formaldehyde solution added shall be determined. A funnel shall be placed in the neck of the flask and the contents heated on a steam bath for 5 minutes, shaking occasionally. After removing from the steam bath, the funnel shall be rinsed with water, the contents of the flask cooled to about room temperature and the excess of NaOH titrated with normal acid, using litmus solution as indicator. (It is necessary to cool the solution before titration with the acid to get a sharp end-point.) The percentage of formaldehyde shall be calculated from the amount of normal NaOH consumed, after correcting the titration, if necessary, for any acidity of the formaldehyde solution as determined by seperate titration with the normal NaOH and litmus solution, without any H_2O_2.

Calculation

1 cc. 1.0 N NaOH = 0.03002 gram HCHO.

Reaction

$$NaOH + HCHO + H_2O_2 = NaCOOH + 2H_2O.$$

Reference

This method is the official method of the Association of Official Agricultural Chemists and is essentially the same as the U.S.P. method.

* This method has been approved by the Non-fibrous Materials Testing Committee of the Technical Association of the Pulp and Paper Industry. Send criticisms and suggestions to R. C. Griffin, chairman, 30 Charles River Road, Cambridge, Mass.

TAPPI Annual Meeting

The program of the meeting to be sponsored by the Paper Testing Committee of the Technical Association of the Pulp and Paper Industry at its annual meeting, February 16 to 18, 1932, has been announced as follows:

"The Determination of Rosin in Paper," by E. Sutermeister and W. V. Torrey of the S. D. Warren Company, Cumberland Mills, Maine.

"The Determination of Unbleached Sulphite," by E. Sutermeister.

"Factors Affecting Results Obtained with Penescope Sizing Testers," by C. E. Libby of the New York State College of Forestry, Syracuse, N. Y.

"Hygrometry in Paper Testing," by F. T. Carson of the U. S. Bureau of Standards. Report on Paper Testing Committee Development Projects:

1. Water Resistance, P. W. Codwise, Buffalo, N. Y.
2. Alpha cellulose, copper number, acidity, pH, iron-copper, by P. F. Wehmer of the Electrical Testing Laboratories, New York.
3. Printing Ink Resistance by B. L. Wehmhoff of the Government Printing Office.
4. Grease Resistance by A. T. Randall of Eaton-Dikeman Company, Lee, Mass.

Any member wishing to contribute a paper to the program of the Paper Testing Committee should write to B. W. Scribner, Bureau of Standards, Paper Section, Washington, D. C.

Chemical Engineers to Meet

The winter meeting of the American Institute of Chemical Engineers will be held in Atlantic City from December 9th to 11th, 1931.

Analysis of Gasoline

Tentative Official Standard Method of the Technical Association of the Pulp and Paper Industry*

This method covers the tests usually made on gasoline for use in automobile and similar engines. Gasoline for this purpose should be free from water and suspended matter, both of which can be detected, if in appreciable amount, by visual observation. It should also be free from corrosive properties, detected by the corrosion test, and from excessive sulphur compounds. It should not contain too large a percentage of highly volatile products which tend to cause "vapor lock" in the engine, as well as large evaporation losses and excessive danger in handling and storage, but should have sufficient volatile constituents to permit starting an engine under reasonably unfavorable conditions without pre-heating. It should not contain any considerable percentage of heavy or non-volatile constituents which, after atomization into the engine cylinders, cannot be completely vaporized and burned. The relative volatility of its constituents is indicated by the distillation range. The methods of test herein described have been adopted by the U. S. Government and the American Society for Testing Materials.

The U. S. Government specifications[1] for motor gasoline are as follows:

Distillation Range:	Deg. F.	Deg. C.
10 per cent	{Minimum 122[2]	50
	{Maximum 176	80
50 per cent	Maximum 284	140
90 per cent	Maximum 392	200
End point	Maximum 437	225
Distillate recovered	Minimum 95 per cent	
Sulphur	Maximum 0.10 per cent	

A clean copper strip shall not show more than an extremely slight discoloration when submerged in the gasoline for 3 hours at 122 deg. F.

Corrosion Test

This method of test shall be used for the detection of free sulphur and corrosive sulphur compounds in motor gasoline.

A clean strip of mechanically polished pure sheet copper about ½ inch in width and 3 inches in length shall be placed in a suitable clean tube or sample bottle. Gasoline under test shall be added so that the copper strip is completely immersed. The test tube or sample bottle shall be closed with a loosely fitting cork and held in a suitable bath at 122 deg. F (50 deg. C.) At the end of 3 hours the gasoline-exposed strip shall be removed and shall be compared with a similar strip of freshly polished copper.

The presence of sulphur or corrosive sulphur compounds is indicated by the corrosion or discoloration of the gasoline-exposed strip when compared with the fresh copper strip.

Gasoline shall be reported as passing the test when on examination the exposed strip shows not more than extremely slight discoloration as compared with the fresh copper strip; otherwise the gasoline shall be reported as not passing the test.

DISTILLATION

Apparatus

(1) FLASK: A standard 100-cc. Engler flask of the following dimensions and allowable tolerances:

	Centimeters	Tolerances
Outside diameter of bulb	6.5	0.2
Inside diameter of neck	1.6	.1
Length of neck	15.0	.4
Length of vapor tube	10.0	.3
Outside diameter of vapor tube	.6	.05
Inside diameter of vapor tube	.4	.05
Thickness of vapor tube wall	.1	.05

The position of the vapor tube shall be 9 cm. ± 3 mm. above the surface of the liquid when the flask contains its charge of 100 cc. The tube is approximately in the middle of the neck and set at an angle of 75 deg. ∓ 3 deg. with the vertical.

(2) CONDENSER: The condenser consists of a 9/16-inch outside diameter No. 20 Stubbs gage seamless brass tube 22 inches long. It is set at an angle of 75 deg. from the perpendicular and is surrounded by a cooling bath 15 inches long, approximately 4 inches wide by 6 inches high. The lower end of the condenser tube is cut off at an acute angle and curved downward for a length of 3 inches and slightly backward so as to insure contact with the wall of the graduate at a point 1-1¼ inches below the top of the graduate when it is in position to receive the distillate.

(3) SHIELD: The shield is made of approximately 22-gage sheet metal and is 19 inches high, 11 inches long and 8 inches wide, with a door on one narrow side with two openings, 1 inch in diameter, equally spaced in each of the two narrow sides and with a slot cut in one side for the vapor tube. The centers of the four openings are 8½ inches below the top of the shield. There are also three ½-inch holes in each of the four sides with their centers 1 inch above the base of the shield.

(4) RING SUPPORT AND HARD ASBESTOS BOARD: The ring support is of the ordinary laboratory type, 4 inches or larger in diameter, and supported on the stand inside the shield. There are two hard asbestos boards; one 6 x 6 x ¼ inch, with a hole 1¼ inches in diameter in its center, the sides of which shall be perpendicular to the surface the other, an asbestos board to fit tightly inside the shield, with an opening 4 inches in diameter concentric with the ring support. These are arranged as follows: The second asbestos board is placed on the ring and the first or smaller board on top, so that it may be moved in accordance with the directions for placing the distilling flask. Direct heat is applied to the flask only through the 1¼-inch opening in the first asbestos board.

(5) GAS BURNER OR ELECTRIC HEATER: The gas burner is so constructed that sufficient heat can be obtained to distill the product at the uniform rate specified below. The flame should never be so large that it spreads over a circle of diameter greater than 3½ inches on the under surface of the asbestos board. A sensitive regulating valve is a necessary adjunct, as it gives complete control of heating.

The electric heater, which may be used in place of the gas flame, shall be capable of bringing over the first drop within the time specified below when started cold and of continuing the distillation at the uniform rate. The electric heater shall be fitted with an asbestos board top ⅛-¼ inch thick, having a hole 1¼ inches in diameter in the center. When an electric heater is employed, the portion of the shield above the asbestos board shall be the same as with the gas burner, but the part below the board may be omitted.

(6) THERMOMETER: The A.S.T.M. low distillation thermometer shall be employed. The specifications cover a total immersion thermometer, graduated in either Centigrade or Fahrenheit degrees, the ranges being 0 to 300 deg. C. or 30 to 580 deg. F.

(7) GRADUATE: The graduate shall be of the cylindrical type, of uniform diameter, with a pressed or molded base and a lipped top. The cylinder shall be graduated to contain 100 cc. and the graduated portion shall be not less than 7 inches nor more than 8 inches long. It shall be graduated in single cubic centimeters and each fifth mark shall be distinguished by a longer line. It shall be numbered from the bottom up at intervals of 10 cc. The overall height of the grdauate shall be not less than 9¼ inches nor more

* This method has been approved by the Non-fibrous Materials Testing Committee of the Technical Association of the Pulp and Paper Industry. Criticisms and suggestions should be sent to R. C. Griffin, chairman, 30 Charles River Road, Cambridge, Mass.

[1] Bureau of Mines, Technical Paper 323B (1927), supplement effective Sept. 1, 1929.

[2] For each percentage less than 4 per cent distillation loss, the minimum requirement on the 10 per cent point may be lowered 5.4 deg. F. (3 deg. C.). Thus, if a sample shows a distillation loss of but 2 per cent, the lower limit may be changed from 122 deg. F. to 111.2 deg. F. (44 deg. C.).

than 10¼ inches. The graduations shall not be in error by more than 1 cc. at any point on the scale.

The set-up of the apparatus is shown in Fig. 1. It may be obtained complete from dealers in chemical apparatus and it is recommended that the complete standard set-up be purchased rather than assembled in the laboratory. It should be specified as the A.S.T.M. gasoline distillation outfit.

Procedure

The condenser bath shall be filled with cracked ice and enough water added to cover the condenser tube. The temperature shall be maintained between 32 and 40 deg. F. (0 and 4.5 deg. C.)

The condenser tube shall be swabbed to remove any liquid remaining from the previous test. A piece of soft cloth attached to a cord or copper wire may be used for this purpose.

One hunderd cc. of the gasoline shall be measured in the 100-cc. graduated cylinder at 55 to 65 deg. F. (12.8 to 18.3 deg. C.) and transferred directly to the Engler flask. None of the liquid shall be permitted to flow into the vapor tube.

The thermometer provided with a cork shall be fitted tightly into the flask, so that it will be in the middle of the neck, with the lower end of the capillary tube on a level with the inside of the bottom of the vapor outlet tube at its junction with the neck of the flask. The thermometer shall be approximately at room temperature when placed in the flask.

The charged flask shall be placed in the 1¼-inch opening in the 6 x 6 inch asbestos board with the vapor outlet tube inserted into the condenser tube. A tight connection may be made by means of a cork through which the vapor tube passes. The position of the flask shall be so adjusted that the vapor tube extends into the condenser tube not less than 1 inch nor more than 2 inches.

The graduated cylinder used in measuring the charge shall be placed, without drying, at the outlet of the condenser tube in such a position that the condenser tube shall extend into the graduate at least 1 inch but not below the 100-cc. mark. Unless the temperature is between 55 and 65 deg. F. (12.8 and 18.3 deg. C.) the receiving graduate shall be immersed up to the 100-cc. mark in a transparent bath, maintained between these temperatures. The top of the graduate shall be covered closely during the distillation with a piece of blotting paper or its equivalent, cut so as to fit the condenser tube tightly.

When everything is in readiness, heat shall be applied at a uniform rate, so regulated that the first drop of condensate falls from the condenser in not less than 5 nor more than 10 minutes. When the first drop falls from the end of the condenser, the reading of the distillation thermometer shall be recorded as the *initial boiling point*. The receiving cylinder shall then be moved so that the end of the condenser tube shall touch the side of the cylinder.

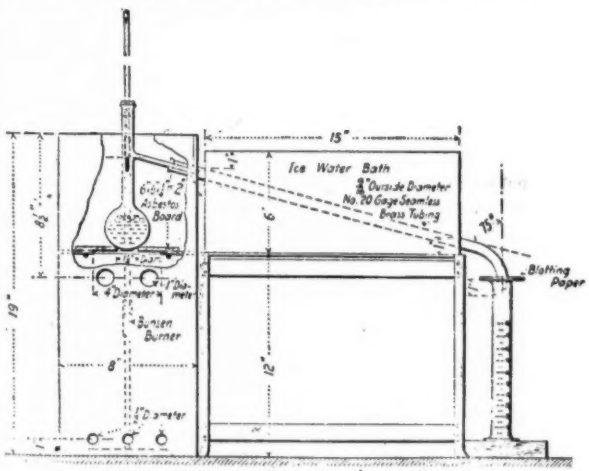


FIG. 1

The heat shall then be so regulated that the distillation will proceed at a uniform rate of not less than 4 nor more than 5 cc. per minute. The reading of the thermometer shall be observed and recorded when the level of the distillate reaches each 10-cc. mark on the graduate.

After the 90 per cent point has been recorded the heat may be increased because of the presence of the heavy ends which have relatively high boiling points. However, no further increase of heat shall be applied after this adjustment. The 4-5 cc. rate can rarely be maintained from the 90 per cent point to the end of the distillation, but in no case shall the period between the 90 per cent point and the end-point be more than 5 minutes.

The heating shall be continued until the mercury reaches a maximum and starts to fall consistently. The highest temperature observed on the distillation thermometer shall be recorded as the *maximum temperature* or *end-point*. Usually this point will be reached after the bottom of the flask has become dry.

The total volume of the distillate collected in the receiving graduate shall be recorded as the *recovery*.

The cooled residue shall be poured from the flask into a small cylinder graduated in 0.1 cc., measured when cool, and the volume recorded as *residue*.

The difference between 100 cc. and the sum of the recovery and the residue shall be calculated and recorded as *distillation loss*.

Accuracy

With proper care and attention to detail, duplicate results obtained for initial boiling point and maximum temperature, respectively, should not differ from each other by more than 6 deg. F. (3.3 deg. C.) Duplicate temperature readings at the various percentage points should not differ by more than the amounts equivalent to 2 cc. of distillate at each point in question.

Correction for Barometric Pressure

The actual barometric pressure shall be ascertained and recorded, but no correction shall be made except in case of dispute. In such cases the temperature points shall be corrected to 760 mm. (29.92 inches) by the use of the Sydney Young equation, as follows:

For Centigrade readings:
$C_c = 0.00012\ (760 - P)\ (273 + t_c)$
For Fahrenheit readings:
$C_f = 0.00012\ (760 - P)\ (460 + t_f)$

in which C_c and C_f are, respectively, corrections to be added to the observed temperature t_c or t_f, and P is the actual barometric pressure in mm. of mercury.

The table following is a convenient approximation of the correction as calculated by the above equation.

TABLE I
BAROMETRIC CORRECTIONS

Temperature range		Corrections * per 10 mm. difference in pressure	
Deg. C.	Deg. F.	Deg. C.	Deg. F.
10-30	50-86	0.35	0.63
30-50	86-122	.38	.68
50-70	122-158	.40	.72
70-90	158-194	.42	.76
90-110	194-230	.45	.81
110-130	230-266	.47	.85
130-150	266-302	.50	.89
150-170	302-338	.52	.94
170-190	338-374	.54	.98
190-210	374-410	.57	1.02
210-230	410-446	.59	1.06
230-250	446-482	.62	1.11
250-270	482-518	.64	1.15
270-290	518-554	.66	1.19
290-310	554-590	.69	1.24
310-330	590-626	.71	1.28
330-350	626-662	.74	1.32
350-370	662-698	.76	1.37
370-390	698-734	.78	1.41
390-410	734-770	.81	1.45

SULPHUR

Apparatus

The apparatus is shown in Fig. 2 and consists of the following: (1) Absorber of chemically resistant glass of about 150 cc. capacity, containing glass beads or short pieces of glas rod in the suc-

* To be added if barometric pressure is below 760 mm.; to be subtracted if barometric pressure is above 760 mm.

tion side as shown: (2) Chimney of chemically resistant glass connected with the absorber by a rubber stopper. (3) Spray trap of chemically resistant glass connected with the absorber by a rubber stopper. (4) Small lamp of about 25-cc. capacity. This lamp may conveniently consist of a 25-35-cc. Erlenmeyer flask and a cork carrying a short section of glass tubing of about ⅛ inch inside diameter. The cork must be grooved along the sides so that air may enter the flask while the gasoline is being consumed. (5) Ordinarily cotton wicking. (6) Filter pump or other means for continuous suction, and rubber tubing to connect with spray trap.

Solutions

The following solutions are required:

(1) Hydrochloric Acid: This should contain 2.275 grams of HCl per liter, carefully checked for accuracy. Each cc. of this solution is equivalent to 0.001 gram of sulphur.

(2) Sodium Carbonate: A solution containing 3.306 grams of Na_2CO_3 per liter. Exactly 10.0 cc. should be required to neutralize 10.0 cc. of the HCl solution.

(3) Methyl Orange: A solution of 0.004 gram per liter in distilled water.

Procedure

Pass two strands of new cotton wicking about 4.5 inches long through the ⅛-inch-diameter wick tube so that they are not twisted but parallel in the wick tube. Trim the wick with very sharp scissors. Pour into the clean, dry lamp about 20 cc. of the gasoline to be tested, insert the wick and cork and weigh the assembly with an accuracy of 0.001 gram. It is advisable to make a blank determination at the same time and under the same conditions by burning sulphur-free alcohol in a similar lamp.

Rinse the absorber containing the glass beads thoroughly with distilled water and add exactly 10.0 cc. of the standard Na_2CO_3 solution from an accurately calibrated burette, allowing the burette to drain for 3 minutes before the reading is taken. Rinse the chimney and the spray trap with distilled water, dry the chimney and connect both to the absorber as shown in Fig. 2. Set up the apparatus for the blank determination in exactly the same manner, using exactly 10.0 cc. of the Na_2CO_3 solution. Apply gentle suction to both absorbers, light both the weighed gasoline lamp and alcohol lamp, and then place in position under the chimneys, so that the tops of the wick tubes extend into the chimneys not more than 1/16 inch. Adjust the wick height and the suction so that the flame is steady, free from smoke, and approximately ¼ inch high. This requires that the wick be flush with the top of the wick tube for most gasolines. The room must be free from drafts. The suction on the blank should be so adjusted that air is drawn through both determinations at the same rate. Continue burning for about 2 hours. During this time the gasoline should be consumed at the rate of about 1 gram per hour.

Extinguish the flames and stop the suction on both absorbers. Weigh the gasoline lamp immediately and calculate by difference the weight of sample consumed. Working with the blank first, disconnect the spray trap and chimney and wash them thoroughly with the methyl orange solution, using a wash bottle with a very fine jet and collecting the washings in the absorber. The amount of solution required for washing should not exceed 35 cc. Carefully titrate the very faintly yellowish solution in the absorber with standard HCl, added to the suction side of the absorber with an accurately calibrated burette. During this titration the contents of the absorber should be agitated carefully, either by blowing through a rubber tube held between the operator's lips and connected at the other end with the chimney side of the absorber or else by the use of a suitable rubber syringe bulb. As the end-point is approached draw the liquid back into the chimney side between each addition of acid and then blow it into the suction side, agitating as before. As soon as the first permanent pink color appears the end-point has been reached. Read and record the volume of HCl solution used.

Rinse the chimney and spray trap used in the actual determination into the absorber to which they were connected, exactly as prescribed for the blank. If the methyl orange solution in the absorber has a pink color, too much gasoline has been burned and the determination must be repeated, burning for a shorter time. Titrate just as in the blank, making sure that the absorber is cold. Read and record the volume of HCl solution required.

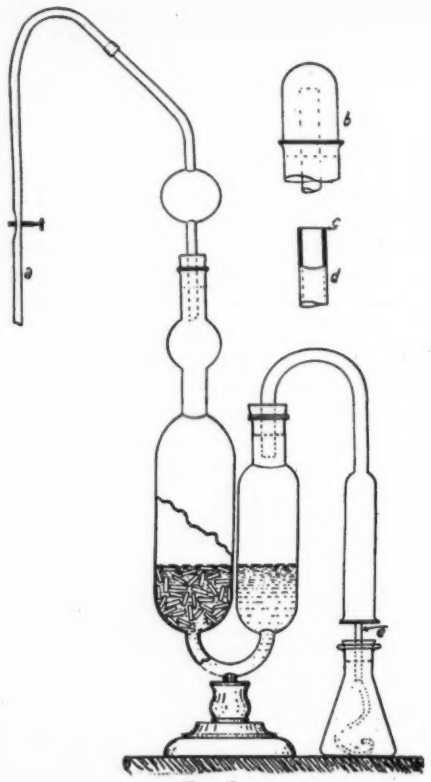


Fig. 2

Apparatus for determination of sulphur in oils (A.S.T.M.): a, Suction tube; b, top of burner with glass cap in place; c, annealed top; d, part section of glass burner; e, glass burner.

Calculate the sulphur content of the oil by substituting the proper values in the following formula:

$$\text{Per cent of sulphur} = \frac{(\text{cc. HCl for blank} - \text{cc. HCl for sample}) \times 0.1}{\text{grams of gasoline burned}}$$

If blank is not run, the formula is:

$$\text{Per cent of sulphur} = \frac{(\text{cc. } Na_2CO_3 - \text{cc. HCl}) \times 0.1}{\text{grams of gasoline burned}}$$

TAPPI Patents Committee Plans

The Patents Committee of the Technical Association of the Pulp and Paper Industry expects by the end of the current year to complete the series of educational bulletins, which have been published under its auspices in the Paper Trade Journal. During the coming year, the committee intends to devote its entire attention to the following objects:

1. To watch the patent situation including legislation and decisions of patent tribunals insofar as they may affect the protection of inventions relating to the pulp and paper industry and to keep the members of the association informed thereof.

2. To actively cooperate with the patent committees of other technical associations in improving the patent system.

The committee will also, whenever it considers necessary, present discussions of a general nature relating to patent matters of particular interest to the paper industry.

Members interested in the activities of the TAPPI Patents Committee should write to Charles W. Rivise, chairman, 1321 Arch Street, Philadelphia, Pennsylvania.

Maintenance and Up-Keep Painting In the Paper Mill*

By C. C. Bliel[1]

Painting in a paper mill may be generally sub-divided into three distinct phases: 1—light, 2—protection, and 3—saving.

It has been proven that a workman employed in a properly lighted and well painted mill, will show from 7 to 15 per cent greater efficiency than one working under slovenly and dirty conditions. In choosing paints for a paper mill, it must be borne in mind that a light colored paint should always be chosen in preference to one that is dark colored, providing equal protection can be obtained from both. This applies to all surfaces of the mill.

Under the heading of "protection," the engineers should make a careful study of the conditions existing in the mill. Atmospheric conditions oftentimes containing dilute quantities of sulphite or sulphate gases, chlorine fumes, etc., have a very definite deteriorating effect upon paints. Humidity conditions, excessive heat, extreme dampness under cool conditions, all have a very direct bearing upon the type of material that should be used. In addition to this, the surface to be coated must be studied. Alkalinity present in masonry walls, inherent moisture in timber, mill scale and rust on steel, all of these must be neutralized and corrected as far as possible, before attempting to paint in any way.

Some paint companies are now equipped to render a definite engineering service along these lines. It has been their job and duty to study these conditions, manufacture products capable of resisting these conditions, and make recommendations as regards the application. For example, it is well known in the paint industry that no paint having a high percentage of linseed oil as a base is satisfactory for use in the presence of continual moisture, or where it is to be used on a surface that has to be submerged constantly in water. In general, asphalt type paints should be used under these conditions. Certain types of synthetic products such as the glyptols, the pyroxylins, the amberols, etc., are adapted to this purpose. Again, linseed oil base paints are worthless when used in the presence of excessive acid and alkali fumes or conditions. Saponification of the oil in this type paint is bound to occur.

Protective Conditions

Further, after studying the conditions as described, it must still be remembered that protection is to be considered in two ways: First—protection against continued inherent disintegration, or disintegration that goes on under the surface of the paint; second—protection against the exterior or atmospheric conditions.

It is often necessary to apply an undercoat over a given surface that has no value from the standpoint of protection against exterior forces. Such an undercoat must of necessity be quickly followed by a finish coat that will adhere readily to the undercoat, and also possess the ability to withstand the exterior forces of disintegration.

The third item mentioned is "saving." The lowest cost product that will do the job right is naturally the one to select. Often a low priced asphaltum offers greater protection than the best grades of high priced enamel paints.

Knowledge of application plays a most vital part in economy, for example, certain types of paint have from five to ten times greater penetration than other types of paint. Where this is the case, it naturally goes without saying that it is not necessary to so thoroughly brush out the former as you would the latter. Frequently one sweep of the brush will obtain greater adhesion with one product than five or six sweeps would with another.

Hot surfaces, such as boilers, steam lines, etc., should be coated with a product that has insulating properties. Aluminum products are available that have been known to decrease the radiation of heat as much as 10 per cent. Conversely if it is desirable to paint a radiator, a product of this kind should not be used, but instead a flat or enamel, which has the ability to give off practically all of the heat that is under the film should be used.

Unpainted surfaces that are in contact with paper stock often give off sand in the case of cement, or rust in the case of metal. These surfaces can be painted with materials that decrease these conditions to a marked degree. Again, extreme care must be exerted in using such types of material as would not affect the finished sheet of paper should a chip or scale of the paint break loose from the surface, thus going through to the finished product. In general, a clear pyroxylin product should be used on such surfaces.

Probably the most important fact of all to remember from an economy standpoint, in painting any surface, is that the product used should be of such a nature that subsequent coats, over a period of ten to twenty years, may be applied with no danger of the film ultimately becoming thick enough to break loose from the surface and falling off. This is accomplished by choosing materials that ultimately fail through chalking. The chalking has two distinct advantages, one is that through its powdery nature, it has a self cleaning effect, the loose dirt particles on the surface being constantly shed. The other is that a chalking product begins to chalk after the surface films of oil vehicle has disintegrated leaving a porous film and one which offers the best possible surface on which to obtain adhesion of subsequent coats.

Masonry and Wood Surfaces

To consider the various surfaces to be painted in a paper mill, they can be roughly subdivided into masonry or wood (walls and ceilings), steel (structural and pipes), machinery, boilers and breeching. For the painting of masonry or wood surfaces, which in general are large surfaces, a light colored pigment should be used. Pigments of this kind include lithopone, zinc, white lead, titanox, and aluminum. White lead, while a good exterior wood protective coating, is practically valueless from a paper mill standpoint, as it readily reacts with sulphur dioxide fumes, to form dark colored salts. This would of course, mean that in a very short time a surface painted with white lead would become discolored and have very little light reflecting ability. Titanox is known as the chalking type of pigment and is often used in conjunction with lithopone or zinc, or both, in mill whites. In general, combinations of lithopone and zinc or burnished aluminum flake, both of which are nearly inert in their chemical reaction toward sulphur dioxide fumes, are the best basic pigments for wall coatings.

Of equal importance is the choice of vehicles or oil content to be used with these pigments. Vehicles available are linseed oil, raw or heat treated, combinations of linseed and rosin, De Mar gum, kauri gum, congo gum, China wood oil and synthetic resins. Leading paint manufacturers have run extensive tests of all of these products, and the following has been found in general to be true:

In cold, damp places, hot, dry places, hot, humid places, or places subject to reasonably normal conditions, the heat treated linseed oil (the cracked oil type) is the premier of these, and has done the best job. All of these conditions are present in all paper mills. I refer in general to beater rooms, finishing rooms and machine rooms. Other combinations such as De Mar gum with linseed oil, show excellent results as to their ability to withstand acid

* Presented at meeting of Lake States Section of the Technical Association of the Pulp and Paper Industry, Menasha, Wis.

[1] Sales engineer, E. I. DuPont de Nemours Co., Chicago, Ill.

fumes and high humidity, but they fail utterly in the presence of nigh temperatures. When referring to high temperatures, I speak temperatures of 85 deg. F. and higher. The only objection to the cracked linseed oil type vehicle is its tendency to become yellow when used in hot, humid places.

From the standpoint of low inventories, and hence lower cost, it is advisable to choose a paint that can be universally used, rather than having to stock several different products.

In selecting a white paint, especially a mill white, bear in mind that test panels on paint farms at Atlantic City and Pittsburgh have proven that paints composed of a combination of two or more white opaque pigments, together with small quantities of tinting colors, have a much longer life and retain their original appearance for a longer period of time than any single pigmented paint or any combination of two or more White opaque pigments untinted. Coincident with this finding, the Edison Company has run extensive tests in recent research work on colored glass and they have proven that a color slightly off the white, on to an ivory, is much more restful to the eye and sacrifices practically no light.

By the addition of a small amount of chrome or sienna pigments to a mill white as above described, this ivory effect can be obtained and at the same time a produce that resists the appearance of yellowing to a marked degree results.

Gloss and Eggshell Paints

One thing further must be considered in choosing a mill white. A comparative study of the advantages and disadvantages of gloss and eggshell type paints follows:

EGG SHELL	HIGH GLOSS
Advantages	Advantages
Diffuses a large amount of light without glare.	Reflects a great amount of light.
May be readily washed and scrubbed.	Will not chip or scale off.
Will not chip nor flake off.	Impervious to moisture.
Impervious to moisture.	Unaffected by machinery vibrations.
Unaffected by machinery vibrations.	
Disadvantages	Disadvantages
None.	Produces eye straining glare.
	Collects more dirt than eggshell.
	It is harder to keep the surface clean and in good condition.
	Light is reflected from its surfaces in sharp angles. It does not diffuse it.
	Pigment content less than the eggshell finish; further, it does not reflect as much light as the egg shell.

This shows conclusively that the eggshell type of paint is far superior to the high gloss, for paper mill use. Another advantage of the egg shell not listed above, is its ability to withstand yellowing to a greater degree than the high gloss paint. It therefore follows that the eggshell type of paint, having a linseed oil vehicle, a combination of lithopone and zinc pigmentation tinted to an ivory, has shown by far the best results on the walls in the paper mill.

The foregoing information applies specifically to the finish coat. it must be remembered that all masonry walls not previously painted, must first be sealed with a spar varnish sealer followed by an undercoater or flat. The sealer must be used to stop the suction of the masonry wall which, if not sealed, would show flat spots in the finished film. The flat undercoat is the hiding coat, or the coat, which when used together with the finish coat, makes a film completely opaque.

Just a word of precaution before painting any masonry or wood. Be sure to remove oil spots with benzine or suitable similar material, as far as possible, and then follow by sealing these spots off with aluminum paint prior to applying the mill white. A masonry wall that shows any tendency to have free alkali present (and this may be discovered by the application of small quantities of phenolthalein) should first be treated with a solution of 3 pounds of zinc sulphate to one gallon of warm water. After allowing time for this solution to dry, dust the resultant salt material from the surface and proceed as before described.

Aluminum Paint

An alternative for the mill white is the aluminum flake mixed 2 pounds of the flake to the gallon of China wood oil spar varnish. This type of finish is highly recommended for use in boiler rooms and places of this type, as it is an inexpensive finish and one which offers light reflection second only to mill white and has the additional advantage of readily shedding dust where same is excessive.

Steel Surfaces

Steel surfaces come under three distinct headings: steel that is used in reasonably dry places; steel that is used in wet places, or steel that carries materials that create a constant condensing condition on the surface; and steel that is subjected to acid fumes. All steel has a tendency to rust through what is commonly known as oxidation. Actually it has been proven in recent years that the rusting of steel is an electrolytic process and one which occurs only in the presence of an electrolite of some kind. In this electrolite an acid condition is set up which reacts with the metal liberating the hydrogen and forming the oxide of iron. For this reason it will be seen that any type of paint which is a good conductor of electricity is not desirable for use in coating steel. Tests run at Atlantic City from 1910 to 1914 inclusive, have borne out this fact.

Again from a chemical standpoint, it will be observed that protective coatings for steel will be directly proportional in their ability to withstand rusting to the percentage of oxygen in the pigment as this oxygen is then available in a greater degree to prevent the hydrogen from coming in contact with the metal, thus setting up an acid reaction. Again, tests run at Atlantic City have proven this feature and we find accordingly that the rust inhibition of pigments rates in the following way. Using 10 as a basis of maximum protection and 0 as the minimum, we find that the following pigments rate in this order:

Artificial graphite	0
Lamp black	0
Sublimed white lead	3.5
Red lead	4
Sublimed blue lead	6
American vermilion or lead chromate	7.5

Actual findings on the field have proven these results to be correct. Fortunately the lead chromate has the advantage over red lead and blue lead in that it can be mixed with spar varnish vehicles, while the red lead and the blue lead must be mixed with raw linseed oil to give best results. The advantage here is two-fold, first, a spar varnish can be flattened so as to permit excellent bonding between the priming coat and the finish coat, whereas the linseed oil invariably gives a glossy surface and one which it is more difficult to apply succeeding coats to, second, for mill work it is a distinct advantage to have a fairly quick drying undercoat. This can be obtained in a spar varnish vehicle, but is impossible in a raw linseed oil vehicle. For the above reasons, lead chromate primers are recommended for all prime coats on steel.

It must be remembered, however, that this product is purely a primer and does not have particularly good resistance to exterior conditions. It must be subsequently coated in a reasonably short time, preferably eight to twenty-four hours with a good protective coating in a light colored pigment so as to obtain the maximum light reflection. Aluminum in spar varnish lends itself admirably to this purpose.

Wet Pipes

While the above information is excellent practice in the presence of reasonably normal conditions, there are many places in a paper mill where the steel is constantly wet or constantly subjected to acid conditions. For years it has been recognized that the asphalt type paint is most resistant to water and acid. The objection has always been that it readily becomes brittle after becoming thoroughly dry and hard and hence offers little protection to the metal after this cracking takes place. Fortunately, in recent years, a product has been developed with an asphalt base emulsified in water whose chemical structure is not altered in the colloidal state and hence returns to its original pure asphalt form after the evaporation of the water. This product is not subject to brittleness, as nothing has been added to nor taken away from the original pure soft asphalt. Rust inhibitive qualities have been

added to this product by the addition of the lead chromate salts. This type product should be applied in two coats and may be applied in the presence of small amounts of moisture. It is not necessary to remove all water or moisture from the surface. As many places in the paper mill are never dry enough to paint properly with the ordinary type paint, this type product has proven extremely valuable in its field.

The foregoing paragraph applies also to bad acid conditions and is recommended highly for use in acid plants, chip bins, digester rooms, etc.

Machinery

For the painting of machinery a slightly different problem faces us. Here we must add beauty and oil resistance to light and protection. In recent years extensive research work has been done in developing synthetic oils and resins to act as vehicles in paints and enamels. The first of these were lacquers. Of more recent date, brittle amberols, quick drying resins, and elastic, quick drying glyptol resins have been developed. The glyptol type product has all of the qualities required of a machinery finish. It is oil resistant to a marked degree, showing practically no discoloration when immersed for a long period in petroleum products. It has a high luster and holds its color for a considerably greater length of time than the old Enamel oil types. It is, moreover, easily applied over any good previously painted surface. It dries dust free in about one hour and is hard in from four to six hours. This quick drying feature makes it possible to coat many pieces of machinery, hand railings, lockers, etc., during the regular weekly shut downs, instead of having to wait until the entire unit is down at some time for repair. It must be remembered, however, that protection against rust must come from a primer such as chromate used under the finish coat of glyptol.

The average cost of painting a paper mill is an expensive item, costing from $5,000 to $15,000 per year. To protect all surfaces and men to the best of your ability at a minimum cost, remember that painting must be done regularly and systematically instead of in a haphazard way by poor workmen at irregular intervals.

The Estimation of Cellulose in Pulps*

By the Kürschner and Hoffer Alcohol-Nitric Acid Method

By Harry F. Lewis[1] and E. R. Laughlin[2]

A new method for the quantitative estimation of cellulose has recently appeared: this is the method of Kürschner and Hoffer.[3] In brief, the impure cellulose such as sawdust or disintegrated pulp, is treated with a 20 volume per cent solution of concentrated nitric acid in 95 per cent ethyl alcohol, for such periods of time and with such amounts of reagents as will completely remove the impurities present in the cellulose. These disappear as follows: lignin is presumed to form nitro-phenolic bodies soluble in alcohol, while the hemi-celluloses hydrolize to water soluble polysaccharides or simple sugars, the authors point out that the pentosans in sulphite pulp are difficult to remove entirely for when this is done, a certain amount of the cellulose is also lost. Under the conditions described, the cellulose is said to remain essentially the same, based upon the value of the copper number and the per cent of cellulose as indicated by the estimation.

This method has recently been studied in comparison with the Cross and Bevan chlorination method on a wide variety of representative pulps. Both rag and wood stocks have been analyzed; the types are as follows:

1. Rag Stocks: a. No. 1 muslin, b. No. 1 hardstock, c. Blue overalls, d. Thirds and blues, and e. Bond stock.

2. Wood Pulps: a. Alpha, b. Super-alpha, c. Unbleached No. 1 pine kraft, d. Bleached soda, e. Unbleached quick cook spruce sulphite, f. Mitscherlich unbleached sulphite, g. Bleached quick cook hemlock sulphite, and h. No. 2 ground wood.

Description of the Work Carried On

In each case, the air dried samples of these stocks, all of known moisture content, were treated by the two methods for the isolation of cellulose. A number of these purified celluloses were then investigated to determine their cuprammonium viscosities by the method outlined by Bialkowsky.[4]

Alpha-cellulose values were also determined on the original pulps using a method similar to the method described by the Cellulose Section of the American Chemical Society.[5]

The modification of the Cross and Bevan method found among the analytical methods of the U. S. Forest Products Laboratory[6] has been used in determining the cellulose in pulps by the chlorination method. The pulps were successively chlorinated until the fibers when washed with sodium sulphite, showed either a white color or a faint pink tinge.

Method of Kürschner and Hoffer

The method of Kürschner and Hoffer as outlined in the original reference has been modified in order to shorten or simplify the laboratory manipulations. The original method reads as follows:

Approximately one gram of the material to be analyzed, weighed into a 250-cc. flask, is thoroughly shaken with 25 cc. of a solution containing 20 cc. 95 per cent ethyl alcohol and 5 cc. of concentrated nitric acid. The flask with its contents is then heated on a boiling water bath under a reflux condenser for one hour. The supernatent liquid at the end of that time is decanted through a filter glass or Büchner funnel, the material on the funnel washed back in the flask with a little fresh reagent and then sufficient additional of the alcohol-nitric acid reagent added to bring the total volume of fresh reagent to 25 cc. The flask with its contents is again refluxed for one hour, filtered and the residue washed with alcohol and water and dried at a temperature not higher than 108 degrees. The raw cellulose thus obtained is tested with cold phlorglucinol—HCl for lignin and with a hot solution of the same reagent for pentosans. In the presence of lignin, the cellulose fibers color cherry red while the reagent remains colorless; if pentosans are present, the phlorglucinol—HCl solution turns red on heating the mixture. When the raw cellulose after two treatments with alcohol-nitric acid still contains lignin, the treatments must be renewed until the test indicates the absence of lignin. The celluloses of the various woods could be obtained lignin-free, usually after three hours cook.

Kürschner and Hoffer report a number of determinations made by the above method on a variety of woods. The values obtained are in the general range of others reported in the literatur. In addition they give analytical data showing the changes taking place in the weight of residue after each of six successive treatments with the reagent, of a sample of filter paper. This data indicates that the cellulose per cent reaches a constant value after the third treat-

---

* Presented at the fall meeting of the Technical Association of the Pulp and Paper Industry, Kalamazoo, Mich., Sept. 24-26, 1931.
Contribution of the Pulp Testing Committee.

[1] Member TAPPI, professor, Institute of Paper Chemistry, Appleton, Wis.

[2] Junior member TAPPI, Pennsylvania Salt Co., Scholar, Institute of Paper Chemistry.

[3] Kürschner and Hoffer, Chem. Ztg. 55, 161, 182 (1931).

[4] Bialkowsky. Technical Association Papers, p. 195, May, 1930.

[5] Ind. Eng. Chem., Anal. Ed. 1, 52 (1929).

[6] Bray, Methods Used at the Forest Products Laboratory for the Chemical Anal. of Pulps and Pulpwoods, Madison, Wis., Aug., 1928, p. 12, Method 33.

ment. The copper numbers of the sample as determined by the Schwalbe-Braidy method increase after the first and second treatments and thereafter likewise remain constant.

The method as described calls for too many transfers from flask to funnel and funnel to flask to recommend it for general routine use. Hence it was modified as follows: the sample is weighed directly into a 50-cc. Pyrex lipless centrifuge tube and the fresh alcohol-nitric acid reagent added. After mixing well, a long air condenser constructed of a five foot length of glass tubing is fitted tightly by means of a good rubber stopper and the tube and its contents refluxed for one hour on the boiling water bath. At the end of that time, the tube is centrifuged along with its duplicate for several minutes in a high speed centrifuge fitted with a protecting dome. In this way the supernatent reagent is easily separated from the cellulose mat. A second 25 cc. of reagent is then added, the tube refluxed for an hour and after centrifuging, decanted again. The residue is washed by adding 25 cc. of alcohol to the material in the tube and stirring around well with a stirring rod, the wash alcohol being separated by centrifuging. This is done three times and then the cellulose washed with water in the same manner until the washings are no longer acid. The last washing is carried out with hot water. Tests are made with phlorglucinol—HCl reagent on the cellulose residue. If lignin is present, the procedure is continued.

Laboratory Data

In Table I are listed the data developed in the investigation. Column 1 gives the alpha-cellulose content of the pulp, column 2 the Cross and Bevan cellulose, column 3 the number of chlorinations required, column 4 the Kürschner-Hoffer cellulose, column 5 the number of cooks required, and column 6 the ratio of Kürschner and Hoffer cellulose to Cross and Bevan.

TABLE I

Stock	Alpha Cellulose	C-B Cellulose	No. Chlorinations	K-H Cellulose	No. Cooks	Ratio K-H : C-B	Remarks
No. 1 muslin	97.0	99.4	2	97.4	2	.981	Both residues white
No. 1 hardstock	97.1	99.8	2	97.9	2	.981	Both residues white
Blue overalls	97.7	99.7	2	97.9	2	.982	Both residues white
Thirds and blues	96.1	98.8	2	96.5	2	.977	Both residues white
Bond stock	95.9	99.5	2	97.0	2	.975	Both residues white
Alpha	91.9	99.3	2	96.3	2	.970	Both residues white
Super-alpha	91.0	99.6	2	96.3	2	.967	Both residues white
Bleached quick cook hemlock sulphite	86.5	98.2	2	96.0	2	.978	Both residues white
Bleached soda	80.6	98.8	2	94.3	2	.954	Both residues white
Unbleached pine kraft	90.3	92.3	4	87.5	2	.949	K-H cellulose yellow
Unbleached quick cook spruce sulphite	88.9	95.8	2	95.1	2	.993	K-H cellulose slightly yellow
Mitscherlich unbleached sulphite	84.7	96.0	2	93.4	2	.973	K-H cellulose slightly yellow
No. 2 ground wood	91.9	67.5	4	63.4	4	.940	C-B cellulose white K-H cellulose high yellow

In every case the chlorinated cellulose value is higher than the alcohol-nitric acid cellulose. The ratio of the two values is approximately constant in the case of the rag stocks (maximum variation — .7 per cent) but on the wood pulps the variation is as great as 6 per cent. The Kürschner and Hoffer values of the rag stocks are, however, very much the same as the values for alpha cellulose.

In this connection it should be pointed out that the alcohol-nitric acid reagent is extremely active chemically, being hard on the hands, the desk and the clothes of the operator. Alcohol and concentrated nitric acid when mixed, fume violently and give off large volumes of the lower oxides of nitrogen. As the originators of the method point out, this may be eliminated by adding a small quantity of urea to the alcohol before adding the nitric acid. Under the best of conditions the method is time consuming, the end point is uncertain and the data obtained of questionable practical value.

Effect of the Number of Cooks on the Nature and Amount of Cellulose by the Kürschner and Hoffer Method

Samples of No. 1 unbleached pine kraft and rag bond stock were treated successively five times with the alcohol-nitric acid reagent. The results are listed in Table II. They indicate that cellulose material is being continuously destroyed in the process.

TABLE II

Stock	No. K-H Cooks	Per cent Cellulose	Test with Phlorglucinol—HCl
No. 1 unbleached pine kraft	1	90.4	Slight color
	2	87.5	Very slight color
	3	85.5	No color
	4	83.2	No color
	5	82.8	No color
Bond stock	1	98.3	
	2	97.0	
	3	96.9	
	4	94.6	
	5	94.0	

Comparison of Cuprammonium Viscosity of the Cross and Bevan and the Kürschner and Hoffer Cellulose

The cuprammonium viscosity values give an indication of the extent to which a cellulose sample has been degraded. Viscosities of samples isolated by the two methods were determined and compared with the viscosity of the original pulps. This data is listed in Table III.

TABLE III

Stock	Original viscosity	C-B cellulose viscosity	K-H cellulose viscosity
No. 1 muslin	203.0	22.4	3.1
Super-alpha	50.7	23.2	3.4
Unbleached spruce sulphite	49.5	17.9	4.5
Blue overalls	42.5	24.9	3.6

This indicates that the cellulose isolated through the action of alcohol-nitric acid has either been degraded to a much greater extent than is the Cross and Bevan cellulose or been chemically modified to a product of different physical properties than the unmodified cellulose.

It might be expected that the alcohol-nitric acid reagent would form oxy-cellulose which could be indicated by an increased copper number. This is not the case, however, as there is very little change in copper number. Qualitative tests on all the Kürschner and Hoffer cellulose samples indicated the presence of nitrogen. Quantitative measurements gave between .25 to .5 per cent N. The conclusion is that the alcohol-nitric acid reagent not only nitrates and degrades the lignin but also acts in a similar manner on the cellulose.

Conclusions

A comparative study of the Cross and Bevan chlorination method and the Kürschner and Hoffer alcohol-nitric acid method has been carried out.

1. The results show that the cellulose values are not the same for the two methods, the Kürschner and Hoffer value in every case being lower than the Cross and Bevan value. With the rag stocks, the ratio, $\frac{\text{cellulose Kürschner and Hoffer}}{\text{cellulose Cross and Bevan}}$, is a constant.

2. With the same rag stocks, the Kürschner and Hoffer cellulose value is approximately the same as the value for alpha-cellulose, determined in the usual manner with 17.5 per cent NaOH.

3. The method has been modified through the use of the centrifuge to materially shorten the time required.

4. Even as modified, in view of the reactivity of the reagent, requiring special care in its use, the time consumed in the determination, the uncertainty of the end point, and the lack of significance of the results, the method is not satisfactory for general use with our present knowledge.

Current Paper Trade Literature

Abstracts of Articles and Notes of Papermaking Inventions Compiled by the Committee on Abstracts and Bibliography of the Technical Association of the Pulp and Paper Industry

Clarence J. West, Chairman

For photostatic copies of articles appearing in the Abstract Section, address the chairman of the Abstracts Committee, Dr. Clarence J. West, National Research Council, 21st and B Streets, Washington, D. C. The charge for this service is: Photostats 9 x 11 inches, 18 cents each; 18 x 11 inches, 35 cents each; 22 x 18 inches, 70 cents each; minimum charge, 50 cents. Payment should be made upon receipt of invoice. Copies of United States patents may be obtained from the U. S. Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Sulphite Process

Investigation of the Roasting of Various Pyrites for the Preparation of the Sulphite Acid. W. G. Campbell and J. Booth. Tech. Chemic Papier Zellstoff Fabr. 27, No. 4: 49-55 (May 3, 1930).—The cause of the baking in the roasting of sulphur pyrites is traced to the presence of iron oxides. The amount of flue dust depends upon the specific gravity of the pyrites, and this can be separated by electrical means so that even selenium ores can be used. Rio-Tinto ores were investigated with the various types of ovens and samples were taken at various stages of the roasting. Methods of analysing the acid for selenium were given and experiments were also made to determine the influence of selenium in the cooking acid upon the pulp produced. It was found that selenious acid had a greater effect than selenic acid. The presence of magnesium salts in the cooking acids seems to destroy the effects of selenium and hence it should be possible to utilize ores with a higher content of selenium.—J. F. O.

Cooking of Sulphite Pulp With Strong Cooking Acids. E. Hagglund. Zellstoff Papier 11, No. 6: 338-341 (June, 1931).—By the use of cooking acids rich in calcium oxide it is possible to increase the yield to a maximum of 55 per cent. The author has investigated the influence of higher sulphurous acid content in the cooking acid on the yield of pulp and its decomposition. The cooking acids were made up with calcium and magnesium bisulphite containing 8 per cent total SO_2 but varying amounts of calcium and magnesium oxide. The maximum temperature was 120 deg. and the yield was 5 to 10 per cent higher than what was normally obtained. The formation of sulphuric acid was greater if the calcium and magnesium oxide content was increased. The destruction of sugars is less with magnesium oxide. The cooking with acids containing calcium is better for the manufacture of pulp than with an equivalent amount of magnesium; for the yield of sugar, the reverse is true. On the basis of the greater solubility of the magnesium sulphite over the calcium sulphite at the decomposition temperature is the possibility to even out this difference by the use of cooking rich in magnesium oxide.—J. F. O.

Development of the Sulphite Process. L. E. Jonte. Tech. Assoc. Papers Series 14: 286-287 (May, 1931); Paper Trade J. 93, No. 6: 46-47 (Aug. 6, 1931).—A brief outline of some of the more important developments of recent years.—A. P.-C.

Neutral Sulphite Pulping Process. III. Effect of Digestion Temperature on the Rate of Delignification. Mark W. Bray and Paul R. Eastwood. Tech. Assoc. Papers Series 14: 297-301 (May, 1931).—On digesting black gum with sodium sulphite and with mixtures of sodium sulphite and sodium bicarbonate, increasing the temperature a little more than doubles the rate of the pulping reaction at every step of 10 deg. C., over the range studied (140 deg. to 170 deg. C.). Mathematical expressions are presented showing severally the relationship between the rate of lignin removal, the rate of chemical consumption and the time and temperature of digestion. Under the conditions of the investigation, the order of the reaction appears to be above monomolecular. Upon substituting the proper values in the general formula for a bimolecular reaction it was found that, for all practical purposes, the reactions involving lignin removal and chemical consumption proceeded as though the pulping reaction was one of the second order.—A. P.-C.

Morterud's Circulation system for the Sulphite Process. Marquard H. Lund. Paper Trade J. 93, No. 5: 35-36 (July 30, 1931).—A brief description of the Morterud forced circulation system for sulphite digesters (covered by U. S. pat. 1,802,266, April 21, 1931) as designed for indirect and for direct cooking. The merits of the system are briefly outlined.—A. P.-C.

Process for the Manufacture of Aromatic Compounds from the Sulphite Waste Liquor. A. R. Lindblad, Stockholm. Swed. pat. 71,006 (Oct. 5, 1928).—After more or less complete precipitation of the lignin substances in the waste liquor and the separation from the same, it is subjected in the presence of catalyzers and at increased temperatures and pressures to a reducing treatment.—J. E. O.

Mechanical Process

Artifical Pulp Grinding Stones. A. St. Klein, Zellstoff Papier, 11, No. 3: 140-141 (March, 1931).—Data concerning the strength properties of the artificial stone and the difference between this stone and the natural stone are given. The author describes the basic materials and the binder, the manufacture of the artificial stone in relation to its physical construction and its chemical composition. Also the method for fastening the stone to its shaft and its stability. The Herkules stone is made of compressed concrete, made of sand and cement. Carborundum is also used as the grinding substance with felspar and clay used as binders. The Norton stone is composed of crystalline aluminum or silica carbide which is embedded in feldspar, kaolin and quartz. Lately silimanite (Al_2SiO_5) has been used as the abrasive, which is made by synthetically burning dextrine, kaolin and aluminum oxide. The artificial stone called Fullnax has embedded grinder rings which are bound to each other with ceramics—J. F. O.

Arrangement for the Greatest Possible Economic Utilization of the Driving Power for Wood Grinders which at Times is Unused. Amme Lutherwerke Braunschweig der iag Muhlenbau and Industrie A. G. Braunschweig Ger. pat. 520,931 (Sept. 25, 1924).—The invention concerns an arrangement in which machines other than the wood grinders can be driven by the same power, or only wood grinders with two or more separate motors can be driven by one and the same motor. It is characterized by having two or more regulators simultaneously set in motion by the change in pressure in the wood grinder.—J. F. O.

Arrangement for the Automatic Regulation of the Wood Feed for Grinders for the Production of Ground Wood. Linke Hofmann Busch Werke A. G. Ger. pat. 520,346 (Feb. 15, 1927).—The drive machine is coupled with a current generator and by means of the rotation of the drive machine regulates the current generated by the rotation of the feed motor.—J. F. O.

Continuous Grinders and Pocket Grinders. J. Hrosch, Wochbl. Papierfabr. 62, No. 17: 402 (April 25, 1931).—Each system possesses advantages and disadvantages, even in the continuous grinders there are variations in pressure. And in both systems the logs can be caught or held up. The quantity of slivers is the same in continuous grinders as with pocket grinders despite literature to the contrary. One man is required for each pocket grinder while

two continuous grinders can be operated by a man. The author is of the opinion that in the future, both systems will be used together.—J. F. O.

Continuous Grinders and Pockets Grinders. E. Englert, Wochbl. Papierfabr. 62, No. 14: 330-331 (April 4, 1931).—The value for the production of the grinders is often expressed as the horse power per 100 kilograms stock per 24 hours. The author recommends a different way of expressing the production, which will be simpler for the business man and also because the power cost can be substituted directly in kilowatt hours, the value will be an international unit. It is expressed by the kilowatt hours consumed times 100 over the kilograms of stock produced.—J. F. O.

Concerning the Difference of the Top and Wire Side of News Print. P. Krais, Wochbl. Papierfabr. 69, No. 24: 573 (June 13, 1931).—By means of an ultra violet lamp the top and wire side of a paper containing much ground wood without filler can be distinguished by the difference in the fluorescence. But in printing papers which have no ground wood, this method fails. The author gives a method which will distinguish between the top and wire side, which is even applicable for coated papers. The paper is placed in a dye and by means of a magnifying glass the top and wire side of the sheet can easily be seen after about thirty seconds in the bath.—J. F. O.

Miscellaneous Pulping Processes

Process and Apparatus for Producing a Product Suitable for Conversion into Cellulose. A. G. Für Halbzellstoff-Industrie. Fr. pat. 704,030 (Sept. 18, 1930).—Coarsely disintegrated wood, bamboo, cotton stalks, sugar cane, etc., suspended in water or in a solution of lime, soda ash, sodium sulphate, etc., is placed in a cylindrical tank provided with a rapidly rotating vertical shaft. Knife blades are mounted on the shaft so as to pass between similar stationary knives mounted on the walls of the tank. Considerable heat is generated, and as it is advisable to work at not over to 60 deg. to 80 deg. C. (according to the nature of the product being treated), the tank is jacketed so as to be able to cool it if necessary.—A. P.-C.

Pulping Process. Samuel Milne. U. S. pat. 1,800,870, (April 14, 1931).—By application of an externally generated, relatively high frequency, transient, electromotive force during the cooking of material for making pulp, it is claimed that the reactions are accelerated, resulting in shortening the time of cooking, or reducing the amount of reagent required, or more complete removal of non-cellulose matter, or permitting of using chemicals at a concentration which would otherwise be inoperative, and also suppressing unwanted reactions. Various examples are given of electrical set-ups; *e.g.*, the steel digester is grounded through a coil and cooking carried out while the local radio station is broadcasting.—A. P.-C.

Manufacture of a Partially Prepared Pulp from Spruce Wood According to the Steam Cooking Process. C. G. Schwalbe and N. F. Hagstrom. Cellulosechemie, 11, No. 12: 233-249 (Nov. 30, 1930).—The authors have tried to simplify the method for the manufacture of a partially prepared pulp which can be used in the manufacture of certain papers which until now have been made from a mixture of ground wood and sulphite. Both the properties and the yield of this new pulp lies between that of ground wood and the sulphite pulp. The process consists of two main steps. 1. The drenching of the wood chips with sulphite cooking acid at a low temperature. 2. To steam the chips after the sulphite liquor has been drained off, under pressure and at a higher temperature. A yield of 59 per cent is obtained by drenching in sulphite for 6 hours at a temperature of 105 deg. and then steaming for 3 hours at 130 deg. The pulp thus produced can be beaten well and is very suitable for certain papers. However this pulp cannot be bleached with calcium hypochlorite. Care must be taken that the temperatures are not exceeded otherwise an inferior pulp will be produced. Attempts were made to improve the quality of the pulp by after treatments with acids and bases at room temperature but without any worthwhile improvement. Besides the production of a good pulp, this process has the following advantages over the ordinary sulphite cooking process. 1. A saving of steam and time by the shorter time and lower temperature in the steam cooking. 2. The possibility of the recovery of the SO_2 in the sulphite waste liquor, since this liquor contains only a small amount of organic matter. The article is very scholarly and contains a vast amount of curves and other data.—J.F.O.

Process for the Manufacture of Pulp. Verein fur Chemische Industrie, A. G. Frankfurt a.M. Ger. pat. 518,985 (Jan. 18, 1927).—Addition to Ger. pat. 507,869.—In carrying out the process according to the original patent 507,869 the cut up raw material is softened at the usual or lower temperatures with mildly acting alkali or acid solutions, or in a warm condition only with water. The raw material is then defibered and subjected to a further decomposition by chlorine.—J. F. O.

Process for the Manufacture of Pulp from Wood by Means of Cooking with Nitric Acid. I. G. Farbenindustrie A. G. Frankfurt a.M. Ger. pat. 518,154 (Jan. 9, 1929).—By introducing nitrogen dioxide or gases containing such, into the reaction mixture, the concentration of the nitric acid used in the cooking will remain constant during the decomposition period.—J. F. O.

Process for the Purification and Loosening up of Pulp. Ernst Mezey, Griez-Dolau, Ger. pat. 514,466 (Feb. 20, 1930).—A pulp obtained in the usual manner by decomposition of the wood and washing, is cooked under pressure for a few hours with the addition of bivalent aliphatic alcohols and their derivatives, especially their mono or dialkylated ethers whose pure or mixed acetates or their chlorine substitution derivatives, alone or in the presence of small quantities of weak alkalies, then washed and bleached as usual.—J. F. O.

Beating

Hydration and Freeness. F. L. Simon. Tech. Assoc. Papers Series 14: 278-280 (May, 1931); Paper Trade J. 93, No. 9: 36-38 (Aug. 27, 1931).—A review of some of the fundamental conceptions underlying the terms "freeness" and "hydration" from a purely deductive standpoint. The following definitions are suggested. Hydration, as applied to paper pulp, designates that condition of the fibers wherein their outer layers are converted to a varying extent into a gelatinized, semi-plastic condition by the addition of water in some loosely bound form. Freeness (or slowness) is the arbitrary figure obtained with one or the other of the commonly used testers.—A. P.-C

Rod Mill Beater Roll. Alfred M. Thomsen. Paper Industry 13: 752f-752g (Sept., 1931).—The Rexman rod mill beater roll consists of a number of compartments symmetrically grouped around a central shaft, each compartment being filled approximately two-thirds full of rods and being very nearly balanced so that the power required to rotate it is small. The reduction of the pulp is accomplished solely by the rods. The flybars attached to the periphery of the roll act in conjunction with a shredder bedplate to constitute an efficient breaker or disintegrator for lap stock; they also serve to circulate the pulp over the backfall and to deliver a continuous stream of pulp to the top of the roll thus keeping the voids between the rods evenly filled with pulp. The performance of the machine, as compared with an ordinary beater, is discussed, bringing out more particularly its much lower power consumption and its less drastic action on the fibers.—A. P.-C.

Hydration of Wood Cellulose. George H. McGregor. Paper Trade J. 93, No. 7: 39-42 (Aug. 13, 1931).—Experiments carried out to establish the relationship between cellulose and water at various degrees of beating by means of displacement (with alcohol), freezing-point (of sucrose solutions) and rate of evaporation over concentrated sulphuric acid showed that in so-called "hydration" no true chemical compound of cellulose and water is formed.—A. P.-C.

Short Cut for Control Work in the Paper Mill. D. S. Davis. Pulp Paper Mag. Can. 30: 911 (Aug. 6, 1931).—A nomographic freeness-consistency chart for the Schopper-Riegler beating tester is given and explained.—A. P.-C.

Continuous Paper Beater. Thomas J. Mullen U. S. pat. 1,790,830 (Feb. 3, 1931).—The beating of the stock is accomplished by means of a beater roll co-acting with a bed plate in the usual manner. Brushing of the stock is accomplished in the same machine by providing brushing bars on the ends of the roll to co-act with similar bars mounted on adjustable plates attached to the sides of the trough opposite the ends of the roll. The stock which has been brushed to the required degree of fineness is drawn off continuously through slots between the brushing bars on the walls of the trough.—A. P.-C.

Beating-Engine Recorder. Edward A. Haynes assignor to Port Huron Sulphite Pulp and Paper Co. U. S. pat. 1,779,419 (April 7, 1931).—The beater roll pressure is transmitted to a diaphragm covering an enclosed chamber connected to a suitable indicating and recording mechanism, so that a permanent record may be made of the beater pressure throughout a run.—A. P.-C.

System of and Apparatus for Beating Paper Pulp. William V. Knoll assignor to Mid-West Machine Co. U. S. pat. 1,793,095 (Feb. 17, 1931).—A relatively small beater roll (preferably about 24 inches in diameter) is rotated at high speed (300 r.p.m. or more) inside a totally enclosed casing containing an adjustable bed plate. The stock is fed to the beater either by gravity or by a pump, so that the beater proper does only the beating work and does not have to circulate the stock. The latter may be recirculated through the same beater until beating is completed or may be passed through two or more beaters in series. The system is claimed to have a much lower (about 80 per cent less) power consumption than the ordinary beater, and to permit finer adjustment of beating conditions.—A. P.-C.

Kollergang with a Revolving Plate and Central Greasing. Peter Spengler and Johan Spengler, Swinemunde. Ger. pat. 504,850 (March 7, 1928).—The principle of the invention is that the oil chamber of the ball bearings for the plate is connected with the oil chamber for the gearing underneath. The latter is also connected with the large oil chamber of the kettle shaped drive gears. The oiling to these three chambers is provided by having a container with feed lines which are provided in the proximity of the master shaft.—J. F. O.

New Process for the Pre-treatment of Old Papers. F. Blume, Wochbl. Papierfabr. 69, No. 23: 551-554 (June 6, 1931).—A breaker beater, Endler patent, is described, in which the distance of the roll from the bed plate is constant and such that there is no beating action of the stock. A specially constructed perforated drum is used through which the broken up stock passes. By means of illustrations the construction and operation of the beater are given, along with its advantages.—J. F. O.

Bleachability Test for Soda and Sulphite Pulps. George H. McGregor. Paper Trade J. 93, No. 5: 36-37 (July 30, 1931).—The following test can be completed in 10 mins. and gives results which are quite satisfactory for works control: bring the sample to constant moisture content by stirring a hand-pressed ball of the pulp, 2.5 in. in diameter, in 800 cc. of water and centrifuging exactly 1 min.; to the equivalent of 5 g. of oven-dry pulp, in a 400-cc. breaker, add water to 95 cc., adjust the temperature to 25 deg. C., add quickly 100 cc. of N/50 potassium dichromate and 5 cc. concentrated hydrochloric acid, stir intermittently, after exactly 5 min. filter through a 3-in. Buchner funnel into a 500-cc. filter flask, to a 50-cc aliquot of the filtrate add about 5 g. potassium iodide and starch indicator solution, and titrate to a green end point with N/50 sodium thiosulphate. The bleach equivalent is obtained from the chart for the particular pulp. Charts showing the relationship between dichromate consumption and per cent bleaching powder required to bleach to a good white are given for aspen soda pulp and for regular sulphite pulp; they were obtained by applying the bleachability tests and actually bleaching the pulps to the required shade of white.—A. P.-C.

Combined Bleaching of Pulp. I Chinchin and N. Rosenherger. Bumazhnaya Prom. 9, No. 10: 17-25 (Oct., 1930); Chimie & Industrie 25: 1487 (June, 1931).—From the results of comparative bleaching tests by the combined, two-stage and single-stage bleaching processes, the authors express a preference for the combined and two-stage processes. As the fibers are not attacked, the yield of bleached pulp is not reduced as in the single-stage process. The saving in bleach is 35 per cent for the combined and 20 per cent for the two-stage process. For the removal of the chlorinated lignin compounds, it is preferable to use caustic soda (0..8-1.2 per cent of the dry weight of the fiber) which eliminates the incrusting material without attacking the fibers. Sodium carbonate and lime give a yellowish pulp.—A. P.-C.

Continuous Bleaching Process. Emil Ekeberg. Fr. pat. 700,381 (March 16, 1931).—The pulp, in loose form, is fed continuously to an endless travelling conveyor together with a suitable amount of bleach liquor. The rate of travel is regulated to obtain the bleaching effect on the conveyor, without further mixing of the pulp and liquor; and the mixture is withdrawn continuously at the desired point. In the embodiment described, the conveyor is in the form of a rotating annular plate.—A.P.-C.

Sizing

Silicate in Cover Paper. A. C. Neilsen Co.; and H. H. Latimer. Paper Mill 54, No. 338: 25-26 (Aug. 15, 1931).—A survey of the use of sodium silicate at the mill of the Beckett Paper Co. showed that it shortened beating time by about 30 min., which resulted in a saving more than sufficient to pay for the silicate and alum used. It improved the hardness, finish, snap, texture, appearance and ink resistance of the paper and increased the Elmendorf tear test.—A. P.-C.

Rosin and Rosin Sizing. Fred Grove-Palmer. Paper Maker & Brit. Paper Trade J. 82, No. 1: vii-x (July 1, 1931).—A general descriptive article dealing with sources and supplies, preparation of different types of size, and methods of analysis of the size.—A. P.-C.

Construction and Installation of Plants for the Preparation of Size by the Delthirna Process. I. Chuvliakov and I. Bardyni. Bumazhnaya Prom. 9, No. 10: 46-53 (Oct., 1930); Chimie & Industrie 25: 1488 (June, 1931).—A comparison of the plants installed in three Russian paper mills. There are as yet no theoretical or empirical basis which may score as a guide in the construction of these plants.—A. P.-C.

Sizing Difficulties Aided. Zellstoff Papier, 11 No. 4: 205 (April, 1931).—Directions for the preparation of a rosin size, free from objections, is first given. The following substances, used as colloids, are added to the rosin, size, animal glue, Ireland moss, potatoe starch, albumin, casine and stearine. Some of these substances are described in detail. Besides the ordinary paper makes alum, potassium and chromium alums as well as ammonia are used for special papers. The addition of substances to aid in the sizing must be done in consideration of the kind of paper which is to be made, a few examples being given.—J. F. O.

Water Glass as an Aid in the Sizing of Paper. Zellstoff Papier, 11, No. 4: 204 (April, 1931).—A practical example of the use of water glass as a sizing agent with its resultant improvement of the paper, is reported. A dust free slit is obtained when water glass is used. A paper which would not lie flat, had this trouble removed when water glass was used in the furnish. The beating time is shortened, and the loss of fiber is decreased even when three times as much filler is used. By the use of water glass many of the difficulties in using rosin size are removed.—J.F.O.

Contribution to the Understanding of the Delthirna Rosin Sizing. Erwin Diamant, Austria. Tech. Chemie Papier Zellstoff Fabr. 27, No. 11/12: 149-152 (Nov. 29, 1931).—The physical chemical properties of the Delthirna sizing are described, accompanied with several tables of results of microscopical and ultramicroscopical investigations. The Delthirna rosin sizing system is a perfect colloidal solution. In comparison with the size of the particles of the ordinary rosin size, the Delthirna size particles are very small, in fact they are for the greater part, of molecular size. By the addition of a suitable electrolite, the size of particles can be increased. This addition of electrolite also increases the

content of free rosin. Furthermore the content of free rosin can be increased to a 100 per cent by simple dilution (hydrolysis) as well as by the addition of hydrogen ions.—J. F. O.

Process for the Manufacture of Paper. Karl Sveen, Aas, Norway. Ger. pat. 517,228 (July 21, 1925).—A substance which acts as a size is added to the stock between the beater and the inlet to the wire of the machine. The patent is characterized in that the substance acting as a size is added in the form of a thin dispersion in a quantity not exceeding 1 per cent of the dry paper, and in a continuous stream. Additional sizing substances such as animal sizing is added to the solution at the usual or lower temperatures.—J. F. O.

Dyes

Some Useful Hints on Paper Coloring. Anon. Pulp Paper Mag. Can. 30: 978 (Aug. 27, 1931).—A brief outline of the behavior of the different kinds of pulps towards the various classes of dyes.—A. P.-C.

Arrangement for Carrying out the Process for the Application of Colors, Dissolving or Etching Liquids; in the Form of Designs on Wet Paper, Board or Similar Webs During its Manufacture. Gebr. Palm, Papierfabriken, Neukochen. Ger. pat. 517,325 (Dec. 21, 1924).—Addition to Ger. pat. 509,382.—J. F. O.

Drying

Drying of Pulp and Paper. Lassberg. Papier-Fabr. 29, No. 17: 259-263 (April 26, 1931).—In the improvement of drying apparatus more attention is given to the removal of the air in the drying cylinders, since the presence of air diminishes the heat transfer and hinders the removal of the steam condensate. Uniformity of drying and a saving of heat is accomplished by the removal of air and water. Contrary to other investigators, the experiments of Lutz and Sureth on the continuous steam circulation with large machines gave no material advantage. The use of hot water as a carrier of heat is described. According to the heat theory, super heated steam is not worse than saturated steam, for heating the cylinders although greater attention must be given to the regulation of the temperature when superheated steam is used. The influence of the porosity of the felt is discussed. The construction of radiation heating bodies increases the capacity of the presses and thus aids the drying cylinders. The advantages and disadvantages of the Fidalgo system of drying are given, there is considerable amount of dust formed in the dryers with this process. The Swedish method of drying the pulp on an endless belt with dry air is described, this method does away with the formation of dust. The advantages of the vacuum dryer are given. The removal of the moistened air and the introduction of fresh air is of great importance. The heat of the hot moist air is used to heat the incoming air used on the dryers.—J. F. O.

Process and Device for Removing the Water from Wood and Pulp Packages by Means of a Single Press. J. M. Voith Maschinenfabrik, Heidenheim. Ger. pat. 512,379 (May 16, 1925).—The pile of material is intermittently automatically conducted through the required arrangement to be pressed out.—J. F. O.

Arrangement for the Regulation of the Drying of Materials Such as Paper, Webs, etc. Maschinenfabrik Augsburg Nurnberg A. G. Ger. pat. 517,332 (Nov. 7, 1925).—The invention concerns itself with the drying of materials by means of the introduction of heat from a heat unit. A moisture indicator placed at the exit of the vapors regulates the drying. The amount of warm air is regulated by devices at the entrance to the dryer and at its exit.—J. F. O.

Pulp and Paper Testing

Ink Penetration and Sizing Permanence of Paper. Drechsel. Pulp Paper Mag. Can. 30: 1020-1021, 1042-1046 (Sept. 10, 1931).—Ten different kinds of paper were found to react very differently towards the penetration of writing ink and linseed oil. As the latter is the usual vehicle in printers' ink, the importance of the results for mill operation is significant, particularly, in view of the fact that it is the vehicle which has penetrated the paper when the print has stained through. The usual methods for the determination of the degree of sizing lead to wrong conclusions when applied to paper used for printing purposes. It is suggested to work with linseed oil in this case and to determine the degree of penetration by linseed oil, that is, the time in seconds required for linseed oil to penetrate through the paper. A suitable apparatus for the purpose is the one designed by Albrecht and used by him to determine the degree of sizing; it gives results corresponding to those obtained by the flotation test of Klemm. No relationship between the degree of penetration by writing ink, linseed oil, and commonly determined characteristics of paper could be established.—A.P.-C.

Determination of the Alpha-Cellulose Content and Copper Number of Paper. John O. Burton and Royal H. Rasch. Tech Assoc. Papers Series 14: 233-240 (May, 1931); Paper Trade J. 93, No. 4: 33-40 (July 23, 1931); World's Paper Trade Rev. 96: 611-612, 654, 656 (Aug. 21); 692, 733-736 (Aug. 28); 784-788, 798, 800 (Sept. 4); 886, 888 (Sept. 11, 1931).—Due to the dense, compact formation of the fibers in paper and to the sizing and loading materials incorporated in the sheet, modifications of the methods for determining alpha-cellulose and copper number of cellulosic materials have been made and the methods adapted to paper analysis. The modification considered of prime importance is the reduction of the paper to a cotton-like form by means of mechanical disintegration. It is also very important to take into account the amounts of sizing and loading materials which the paper contains. The alpha-cellulose method is patterned after that of Jentgen with modifications suggested by Parsons and Ross. The copper number method is that of Braidy with a few minor modifications —A. P.-C.

Further Studies on Groundwood Evaluation. E. R. Schafer and Melburn Heinig. Tech. Assoc. Papers Series 14: 227-231 (May, 1931); Paper Trade J. 93, No. 10: 55-59 (Sept. 3, 1931).—With a view to evolving better methods of evaluation, samples of groundwood were submitted by company members of the News Print Service Bureau to the Forest Products Laboratory, Madison, Wis., for experimentation. The article presents information obtained on about one-half of these pulps by means of a screen analysis test (Schafer and Carpenter, Paper Trade J. 90, No. 19, 57-61 (May 8, 1939)), a rate of flow test (Schafer and Carpenter, Paper Trade J., 91, No. 3, 57, 61 (July 17, 1930)), and a static bending test (Heritage, Schafer and Carpenter, Paper Trade J. 89, No. 17, 50-52 (Oct. 24, 1929); 91, No. 3, 61-65 (July 17, 1930)), as well as by the more established testing methods. Information is also given in modifications and improvements which have been made in these tests since they were previously reported. The data have additional interest in that they represent a cross-section of North American groundwood practice. The results are tabulated and discussed. For the detailed data, the original should be consulted. —A. P.-C.

Non Fibrous Materials Testing Committee. R. C. Griffin. Tech. Assoc. Papers Series 14: 231-232 (May, 1931); Paper Trade J. 93, No. 10: 59-60 (Sept. 3, 1931).—A summary is given of the past work of the Committee since its organization in 1915.—A. P.-C.

Volumetric Composition of Paper. P. S. Billington and C. E. Hrubesky. Tech. Assoc. Papers Series 14, No. 1, 273-275 (May, 1931); Paper Trade J. 93, No. 7: 42-44 (Aug. 13, 1931).—The apparatus for the determination of the solid fraction of paper described in a previous paper (Baird and Hrubesky, Paper Trade J. 91, No. 4, 48-51 (July 24, 1930); Tech. Assoc. Papers Series 13, No. 1, 230-232 (May, 1930)) has been improved, and the applicability of the method was tested on a number of laboratory-made sulphite test sheets and on 25 samples of commercial papers of different types (the procedure of the method is described in detail). From a consideration of the results of several hundred determinations, the limit of error in determining the solid volume is estimated at about 0.7 cc., so that the error may become very large if the bulk volume is small.—A. P.-C.

POWER PLANT SECTION

REDUCING POWER COSTS THROUGH UNIT TREATMENT

Conducted by **Reginald Trautschold Consulting Engineer**

Pipe Economy*

First Cost—Installation—Operation

The burden imposed by pipe replacement expenses is greater, probably, in the paper making industry than in any other of the major lines of industrial process activity. Not only are miles upon miles of piping employed in and about pulp and paper mills, but much of it is exposed to destructive chemical reactions that are both exacting and varied.

The extensive use of almost every kind of pipe is entailed, the great volumes of liquid handled necessitating the employment of piping of the largest commercial sizes and the handling of highly concentrated chemical solutions the use of much special piping of smaller sizes. Also, in the high pressure steam plant of the modern paper mill, all the complex piping problems that confront and are peculiar to the newer steam generating stations are encountered.

Pipe maintenance considerations introduced by the modern high-pressure steam plant and those pertaining to the handling of concentrated chemical solutions are not, however, confined to the paper making industry. They are highly important, of course, but the piping problems pertaining to the handling of the more dilute solutions, pulp stock, white water, general water supply, etc., are of chief and more general concern.

Corrosion Imposes Heavy Burden

Just how important may become the question of piping is well indicated by the losses in weight through corrosive action given in the following table, comparison being made between common steel pipe and a high quality of iron-chromium-nickel alloy steel pipe, one characterized by marked resistance to most forms of corrosion. The losses in weight are given in grams per square meter for the respective pipes after an exposure of only 100 hours at normal temperature, 68 degrees Fahrenheit.

Solution	Relative Losses in Weight: Common Steel	Spec. Alloy Steel
Well water	1.00	0.00
Pure water and carbon dioxide	28.03	.03
0.5% magnesium chloride	5.44	.00
2.5% sodium chloride (salt solution)	5.00	.00
1/10 normal sulphuric acid	191.00	.05
1/10 normal hydrochloric acid	191.00	.05
1/10 normal nitric acid	147.50	.00
1.5% sulphurous acid	491.00	.00
1/10 normal acetic acid	29.60	.00
1/10 normal tartaric acid	54.80	.00
1/10 normal tannic acid	38.00	.00

The Babcock & Wilcox Tube Company

A further illustration of the unsuitability of common steel pipe for use where an acid condition pertains, as is general in pulp and paper mill solutions, is shown by the results of a very simple test conducted to bring out the superiority of an iron-copper-molybdenum alloy pipe over an ordinary steel pipe in resisting corrosion. Samples of equal weight of these two kinds of pipe were immersed in a 20 per cent sulphuric acid bath, at room temperature, and when again weighed, after twenty-one days, it was found that the common steel pipe had lost 91.0 per cent in weight, while the steel-alloy pipe showed a loss in weight of only 13.4 per cent.

No processes in pulp and paper production entails the immersion of piping in acid solutions of this character, it is true, but the test provides convincing evidence of the costs of corrosion in mills employing unsuitable piping. Wherever corrosion is a factor, and it generally is in the pipe lines of the paper making industry, the pipe material in contact with the liquid carried, the inner surface of the pipe at least, is a very important factor in pipe economy. Pipe life measured in months, in weeks or in days as is sometimes the case, need not be countenanced, for when suitable mill piping is employed it can be extended to a question of years of satisfactory service.

Cost Considerations

Not only are the effects of the liquid upon the pipe and of the pipe upon the stock and liquid conveyed considerations of outstanding importance, but the cost factors of installation expenses, power consumption, maintenance and depreciation as well. These latter should commend the same consideration as the selection of pipe, kind of pipe material, to employ.

Obviously, from the point of view of installation economy, a pipe of flexible, light weight, construction can be placed in position, suitably supported, replaced when necessary and shifted should the occasion arise at much lower cost than a rigid, heavier pipe. The lighter pipe is also apt to cost much less per foot. These are all considerations of especial importance in pulp and paper mill piping practice, particularly as many of the mills are located in remote districts where any excess pipe weight adds greatly to expenses. Of course, weight should not be sacrificed at the expense of more important economies, but, as a rule, a heavy, rigid pipe is severely handicapped in pulp and paper mill services and must show marked superiority in respect to maintenance and depreciation to be actually economical.

Sheet metal piping avoids in large measure the burden of costly weight and since various alloyed irons and steels resist corrosion and chemical deterioration far more ef-

* For previous discussions on pipes see PAPER TRADE JOURNAL, March 28 and July 18, 1929 and September 4, 1930.

fectively than does ordinary sheet steel, the trend for some time past has been more and more towards the use of iron-alloy piping in the pulp and paper mill fields, to the exclusion of the cheaper, but actually more costly, common steel piping. Unfortunately, there are only a relatively few varieties of iron-alloy pipes commercially obtainable and while these may prove, and often do, satisfactory for specific mill services under certain conditions, they are palliative rather than corrective. Nevertheless, some highly successful installations, examples of real pipe economy, have been made of certain distinctive varieties of iron-alloy piping, successful from the viewpoint of effectively resisting pipe corrosion in extremely exacting services.

Iron-Alloy and Lined Pipes

For instance, exhaustive tests conducted in three prominent sulphite pulp mills, one in New York state, another

Courtesy: Abendroth & Root Mfg. Co.

FIG. 1
30-inch water supply line in paper mill service.

in Pennsylvania and the third in Canada, showed almost absolute resistance to the severe corrosive action of sulphite liquors under various conditions of pressure and temperature by a high quality iron-chromium-nickel alloy steel pipe. Such piping, it would therefore seem, is admirably adapted for acid lines and digesting piping.

Under certain exacting conditions, however, and where conditions vary considerably, as is frequently the case, additional protecture against pipe deterioration than simply that afforded by the non-ferrous ingredients alloyed with the iron or steel may be advisable. This can be secured by lining the pipe with an inner shell of some substance affording the desired protection, with lead, tin, asphalt, wood, etc. Simply an inner coat of protective paint may sometimes suffice and an outer coat of paint often proves a wise and profitable investment.

The basic pipe metal in these lined pipes serves chiefly as a structure to support and protect the pipe lining, so that sheet metal pipes are employed in such pipe fabrications almost exclusively. The thickness of the supporting pipe walls need be only sufficient to provide the requisite pipe strength and the piping is ordinarily subjected to no abnormal internal or external pressures. This is conducive to the maintenance of the pipe lightness that facilitates handling and holds down installation costs.

Light Weight Pipe Fabrication

Light weight piping without sacrifice of necessary pipe strength is well secured by distinctive methods of pipe fabrication, endless strips of metal plate being wound helically with adjacent edges welded or riveted to form a spiral truss substantially stiffening the pipe and adding considerably to its strength. On account of the stiffness and strength added by the spiral seam truss, much lighter gauge metal can be used than in the more orthodox seamless and straight seam pipe constructions, a saving in weight of from 35 to 50 per cent, resulting.

These spirally constructed pipes, fabricated from suitable iron-alloy plates to secure desirable corrosion resisting qualities, have proved both popular and eminently satisfactory in pulp and paper mill services. Miles of them are employed for water supply lines, intake lines from lakes and streams and in smaller quantities for many other essential services. They are well adapted for handling the atmospheric exhaust relief from turbines, for exhaust steam lines to paper machines, etc., for paper stock lines and for white water and fresh water systems.

At the Strathmore Paper Company plant at Woronoco, Mass., the water supply is brought in over 1,000 feet, through granite cuts, under bridges and post roads, by a 30-inch spirally constructed pipe line, at the end of which a 24-inch branch line of similar pipe construction diverts water for mill use to a filtering plant. A 20-inch spiral pipe line equipped with a twin strainer extends to the lower end of the mill, near which a 16-inch branch line furnishes water for the condenser of a 2,500-kilowatt turbine engine. A 12-inch branch line supplies the water for the suction line of two 1,000-gallon fire pumps. This particular installation of spiral piping, after some twelve years or so of service, is still in excellent working condition.

Linings and Inner and Outer Castings of Lead

Very satisfactory results have also been secured with sheet metal pipes with linings and inner and outer coatings of lead and in this connection the experience of the Consolidated Water Power & Paper Company, to which brief reference was made in these columns September 4, 1930, is well worthy of further review. To quote from a report of W. F. Thiele, Chief Engineer of this organization:

"Due to the fact that the river water at Wisconsin Rapids and Biron is acid and due to the fact that settling tanks and filter beds are being used for the fresh water supply coming in contact with the pulp and paper calls for the use of alum, our clear water is decidedly acid. Our galvanized iron pipes have a very short life and ordinary steel pipe corrodes so rapidly that no end of trouble was caused by black specks entering the pulp and paper. During the past two years, we have practically repiped these two mills, as far as the stock lines and water lines are concerned, and have used either copper tubing or lead coated (inside and out) piping. Our experience to date indicates that the lead coated piping is supplying us with exactly the same service as the copper tubing and at this time we are using lead coated piping

almost entirely for our new extensions. We have found no indications of the lead coating on the inside of the pipe deteriorating in any way and we hope to secure a very long life from the pipes.

"In addition to using lead coated piping for conducting water and pulp, we are also using it for conducting clay in a liquid form, lime in a liquid form and bleaching liquor."

Much the same satisfaction with piping with inner and outer coatings of lead has been secured by the Nekoosa-Edwards Paper Company and shortly after the foregoing report was made, E. P. Gleason, Manager of Power and Engineering for this Wisconsin producer of news print, wall paper, bleached and unbleached sulphite, advised:

"When we built our new Kraft mill last year, the matter of piping for both water and stock was given careful consideration and after some investigation we used . . . leadized (coated inside and out) pipe exclusively on all stock and water lines in the new mill, using several carloads of this material.

"We recently took down several stock lines and water lines for examination and the stock lines particularly were absolutely clean and appeared as if they had been recently burnished.

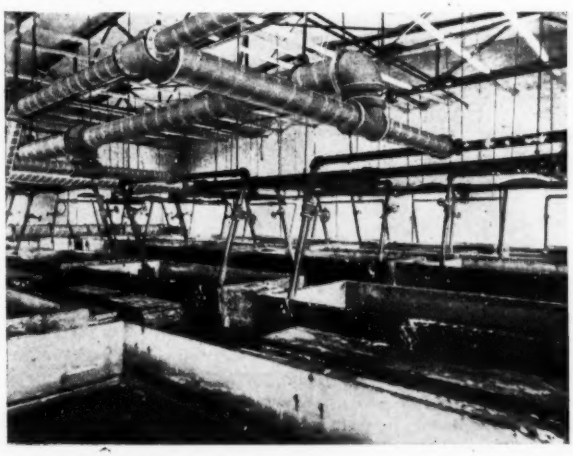
"The water line in damp places was not originally painted and showed some external discoloration and surface rusting, but this did not effect the lead coating. All of these lines have been painted and we are now specifying that all pipe leave the factory with a shop coat of paint on the outside and that it be crated so that the lead coating cannot be scratched or marred in transit.

"In a recent addition to the mill at Nekoosa, we are using further relative large quantities of this material and we do not know of anything better at this time."

Wooden and Wood Lined Pipes

Important advance has also been made in wooden piping and in the more modern wood lines pipes; wood lined fittings, elbows, bends, tees, etc. now being obtainable. Commenting upon the benefits of wood lined pipes in pulp mill services, the Resident Engineer of an important Canadian establishment recently reported as follows:

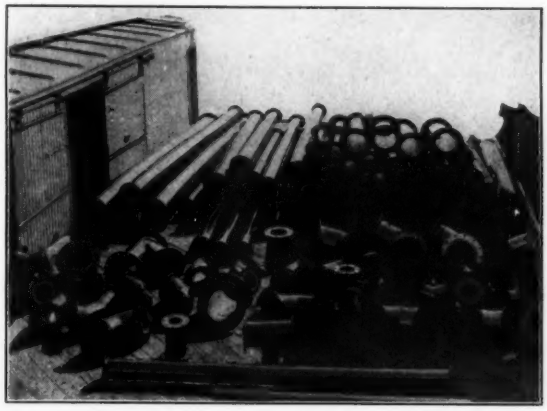
"In specialty mills, the elimination of dirt is of prime importance and its prevention is constantly being sought by paper mill operators and technicians. Dirt will often



Courtesy: Abendroth & Root Mfg. Co.

FIG. 2

Galvanized spiral pipe system in beater room of the Strathmore Paper Company simplifies, by its light weight, overhead suspension.



Courtesy: Michigan Pipe Co.

FIG. 3

Consignment of wood lined pipe and fittings to a Michigan paper mill.

come in slugs, and in some cases can be traced to an accumulation of scale and slime breaking away from the interior of wrought iron or steel pipe. With the use of wood lined pipe, the scale accumulation can be prevented, although it still remains to be seen if slime will accumulate. Slime can be prevented to a degree by keeping a fairly high velocity in the line. This is possible without undue friction loss, due to the co-efficient of friction for wood lined pipes being lower than that of iron pipe.

"In the case of high grade bleached stocks, wood lined, or wood stave pipe, is particularly valuable for the delivery of a clean stock free from specks. The bleaching agents used are generally highly corrosive and attack the common grades of iron and steel pipe. The modern chrome-nickel alloy tubing will stand up satisfactorily, but its cost is prohibitive when compared to wood pipe. A comparison of the life of the two is not possible at this time.

"The fact that wood lined pipe can be made up to exact lengths from the specifications of the mill engineering staff reduces the cost of installation, due to a reduction in pipe fitting labour. The cost of obtaining standard lengths or dimensioned lengths is the same per foot of pipe.

"A large saving of labour is made at installation, due to the light weight of the pipe. Less rigging is required and in many cases the pipe length can be put in place without the use of chair falls or block and tackle. This enables a greater footage of pipe to be run per day with no increased cost.

"Theoretically, the friction loss with wood pipe is lower than that of iron or steel pipe by about 15 per cent. This, however, has yet to be proved by test in our own plant. With a reduction in friction loss there is undoubtedly a power saving, or, on the other hand, a saving in pipe cost can be made, due to a smaller pipe size being used with a resultant increased velocity. In the latter case, there will be no power saving if the friction head is maintained the same in the smaller wood lined pipe as in the larger steel or iron pipe.

"For the handling of pulp at low heads, the elimination of dirt, and ease of installation, we believe that the slightly higher cost of wood pipe is warranted and soon pays a return on the investment involved."

These views well reflect the attitude of the paper mill field to this new form of wooden pipe, as is evidenced by the following comments which, incidentally, also furnish some idea of the classes of service for which the

piping is well adapted. The Ryegate Paper Company, East Ryegate, Vt., states:

"This pipe has been installed on our white water lines and so far has given us most satisfactory results. In fact, the results have been so satisfactory that we expect to use this type of piping (wood lined pipe) on all of the renewals throughout the mill."

Another Canadian mill, one that has had considerable experience with iron-copper-molybdenum alloy wood lined pipe, having purchased and installed several large consignments, advises:

"The pipe we now have installed is in service handling bleached sulphite pulp, and so far has been entirely satisfactory."

C. H. Suhs, Chief Engineer of the Rhinelander Paper Company, as recently as October 27, 1931 writes:

"In our mills we have experimented with standard steel pipe, wrought iron pipe, bronze and brass pipes. We have had trouble with all of them. As regards corrosion, some may question our statement regarding failure of brass or bronze pipe, but we have personally checked brass pipe after two years of service and found replacement necessary, due to deep pits.

"Wood pipe has been in service under similar conditions for several years with no replacement necessary. We consider the wood lined fittings a distinct advance, for the weak point in the (wood) piping system has been the fittings, which have heretofore necessarily been cast iron.

"The fact that there is no corrosion in the wood pipe lines naturally removes that very troublesome source of dirt. Another feature well worthy of thought is that the installed cost of a wood (pipe) line is very low, even less than of standard black iron pipe. We use wood pipe entirely on stock lines, white water lines and will make further fresh water line extensions of wood lined pipe."

Recommendations Dangerous

Recommendations as to the variety of piping to employ for any particular pulp or paper mill service are admittedly dangerous and if followed too closely may even prove quite expensive, but these expressions from experienced men in the paper making industry should, nevertheless, command the attention of all mills, large and small. True, all questions pertaining to pipe economy have not been covered and stress would appear to have been placed upon certain varieties of pipes, but this should not be interpreted as discriminating in any way against the use of more rigid piping or of special and more costly pipes, light, heavy, alloyed or of basic metal, for there are mill processes and conditions that unquestionably require the employment of special piping.

The aim in the present discussion has been simply to present a few generalities, substantiated by the citation of individual mill experiences, concerning meritorious advance piping practices, the inherent advantages of suitable light weight pipes, some little idea of the corrosion resisting qualities of alloyed iron and steel pipes, and of the results secured with pipes fabricated with inner and outer coatings and linings of corrosion resisting materials. Among the varieties of pipes featured, some, upon suitable investigation, will be found to give satisfaction and prove economical in most, at least, pulp and paper mill piping services. True pipe economy, however, entails the striking of a proper trial balance between the effect of the piping on stock and liquid conveyed; the performance of the pipe in respect to simplicity of installation, power expense, upkeep and life; and the initial cost of the installation.

To Manage Westinghouse Advertising

Ralph Leavenworth has been appointed general advertising manager of the Westinghouse Electric and Manufacturing Company, according to an announcement made today by J. S. Tritle, vice-president and general manager. He will have charge of all advertising and publicity activities of the company, the announcement reads, including the advertising division of the merchandising department, now centered in Mansfield, Ohio.

The business career of Mr. Leavenworth, prior to his association with the Westinghouse Company, has been one in which sales and advertising administrative work have been closely paralleled.

Graduating from Hamilton College, Clinton, N. Y., in 1914, he became associated with the Y. M. C. A., with headquarters in Cleveland and remained with that organization four years. After the war he joined the Standard Parts Company, also located in Cleveland, and except for a short period, during which he served as personnel director for a publishing firm, he was advertising manager of this concern, until 1923. In that year he became an account executive for Paul Teas, Inc., an industrial advertising agency. He remained with this firm six years becoming in that time part owner of the company.

January 1, 1930 he joined the Austin Company, of Cleveland, one of the world's largest engineering and building organizations, as assistant general sales manager. In this work he served in an executive capacity on sales, administrative and advertising work concerned with this international organization.

His appointment as general advertising manager of the Westinghouse Company followed. He will have his office in the East Pittsburgh headquarters of the company.

Glens Falls Mills Running Full

[FROM OUR REGULAR CORRESPONDENT]

GLENS FALLS, N. Y., November 20, 1931.—A trend towards improved business conditions is reflected in reports from numerous paper mills in this city and vicinity and a spirit of optimism prevails in regard to the outlook for the coming winter. Conditions at the plant of Finch, Pruyn & Co. are about normal with a full quota of workers being steadily employed. As matters now stand the company is running at about 94 per cent of full capacity with a working force slightly over 200 persons. The record is considered an unusually good one under existing conditions and it is understood that the present schedules will continue for some time. The present situation has existed since early in the summer and officials of the firm are inclined to believe that it will continue throughout the winter.

At the Hudson Falls branch of the Imperial Paper & Color Corporation it was said that conditions were about normal for this season of the year. The plant is running on slightly curtailed schedules and employing in the neighborhood of 75 hands. The number of employees is about the same as is employed at extremely busy periods despite the decrease to some extent in the working hours.

Reports from Plattsburg indicate improved conditions with all paper mills running on day and night schedules. The Underwood Paper Mill, a branch of the Imperial Paper and Color Works, is running with three shifts and a full complement of workers. Both the Saranac Pulp and Paper Company and the Norstrand Manufacturing Company have experienced an increased volume of orders also which has resulted in a 24 hour daily schedule with several shifts of workers.

Cotton and Paper Rolls
Super Calenders
Friction Calenders
Embossing Calenders
Hydraulic Presses and Pumps

Successors to the Granger Foundry & Machine Co.

The Textile-Finishing Machinery Company
PROVIDENCE, R. I.

Sulphur

A FIRST REQUISITE

in

Paper Making

Large Production
Ample Reserves
Prompt Deliveries
Purity 99½%

TEXAS GULF SULPHUR CO.
75 E. 45th Street New York City
Mines: Gulf, Newgulf and Long Point, Texas

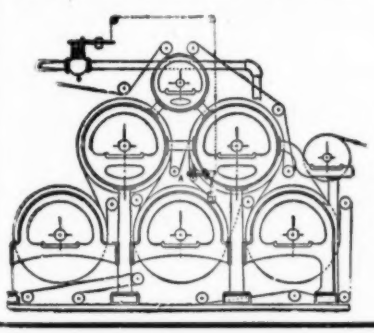
THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY
CANTON, MASS.
Woolen manufacturers since 1856

The Pickles Drying Regulator



WE ARE SAFE IN OUR PROPOSITION
YOU'LL MAKE NO MISTAKE IN ACCEPTING IT

Pickles Drying Regulator

will do everything we claim for it and more. The test costs you nothing until you are satisfied. Many mills tried one and now have every machine equipped. Write for list of users and other information.

W. F. PICKLES **Buckland, Conn.**

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING NOVEMBER 21, 1931

SUMMARY

Cigarette paper	862 cs.
Wall paper	16 bls., 6 cs.
Paper hangings	5 bls., 1 cs.
News print	14 bls., 10522 rolls
Printing paper	34 rolls, 102 cs.
Wrapping paper	19 cs.
Cover paper	1 cs.
Litmus paper	1 cs.
Filter masse	100 bls.
Filter paper	10 bls., 13 cs.
Drawing paper	7 cs.
Colored paper	45 cs.
Decalcomania paper	38 cs.
Baryta coated paper	23 crates, 1 cs.
Gold coated paper	3 cs.
Metal coated paper	92 cs.
Photo paper	4 cs.
Surface coated paper	26 cs.
Tracing paper	1 cs.
Stencil paper	10 cs.
Writing paper	3 cs.
Writing paper and envelopes	5 cs.
Envelopes	16 cs.
Note books	6 cs.
Ivory boards	15 pkgs.
Paper board	10 cs.
Adhesive paper	5 cs.
Wood pulp wadding	25 cs.
Card board	43 cs.
Miscellaneous paper	8 bls., 32 cs.

CIGARETTE PAPER

Champagne Paper Corp., Schodack, Havre, 281 cs.

De Manduit Paper Corp., Schodack, Havre, 1 cs.

Brown & Williamson Tobacco Corp., De Grasse, Havre, 12 cs.

Standard Products Corp., De Grasse, Havre, 53 cs.

Liggett & Myers Tobacco Co., De Grasse, Havre, 25 cs.

Champagne Paper Corp., De Grasse, Havre, 40 cs.

American Tobacco Co., De Grasse, Havre, 450 cs.

WALL PAPER

F. J. Emmerich, Britannic, Liverpool, 3 bls.

Thomas & Pierson, Mauretania, Southampton, 1 cs.

A. C. Dodman Jr. Inc., Westernland, Antwerp, 1 bl.

Guaranty Trust Co., A. Ballin, Hamburg, 5 cs.

F. J. Emmerich, A. Ballin, Hamburg, 11 bls.

Globe Shipping Co., A. Ballin, Hamburg, 1 bl.

PAPER HANGINGS

W. H. S. Lloyd & Co., Minnewaska, London, 1 cs., 5 bls.

NEWS PRINT

Parsons & Whittemore, Inc., American Importer, Hamburg, 223 rolls.

W. H. Bell, Markland, Liverpool, N. S., 5684 rolls.

Perkins Goodwin & Co., Berlin, Bremen, 384 rolls.

Jay Madden Corp., Berlin, Bremen, 305 rolls.

——, Bergensfjord, Oslo, 372 rolls.

Bank of Montreal, Cornerbrook, Cornerbrook, 3554 rolls.

J. P. Heffernan Paper Co., A. Ballin, Hamburg, 14 bls.

PRINTING PAPER

Keuffel & Esser Co., American Importer, Hamburg, 34 rolls.

Globe Shipping Co., Berlin, Bremen, 2 cs.

Bush Service Corp., Berlin, Bremen, 9 cs.

E. Dietzgen & Co., Rotterdam, Rotterdam, 32 cs.

Japan Paper Co., Mauretania, Southampton, 2 cs.

P. C. Zuhlke, Westernland, Antwerp, 12 cs.

Japan Paper Co., Excambion, Genoa, 5 cs.

T. N. Fairbanks Co., Excambion, Genoa, 25 cs.

E. Dietzgen & Co., A. Ballin, Hamburg, 15 cs.

WRAPPING PAPER

E. Dietzgen & Co., Rotterdam, Rotterdam, 10 cs.

Yardley & Co., Maryland, London, 1 cs.

F. C. Strype, Westernland, Antwerp, 7 cs.

Japan Paper Co., Westernland, Antwerp, 1 cs.

COVER PAPER

International F'd'g Co., A. Ballin, Hamburg, 1 cs.

LITMUS PAPER

Pfalz & Bauer, Inc., England Maru, Hamburg, 1 cs.

FILTER MASSE

P. H. Petry & Co., England Maru, Hamburg, 100 bls.

FILTER PAPER

H. Reeve Angel & Co. Inc., Minnewaska, London, 13 cs.

A. Giese & Son, A. Ballin, Hamburg, 10 bls.

DRAWING PAPER

H. Reeve Angel & Co. Inc., Minnewaska, London, 4 cs.

F. Weber & Co., Excambion, Genoa, 2 cs.

Keuffel & Esser Co., Pr. Harding, Hamburg, 1 cs.

COLORED PAPER

J. Beckhard & Co., Berlin, Bremen, 1 cs.

H. Lange Corp., Berlin, Bremen, 2 cs.

S. Gilbert, Berlin, Bremen, 2 cs.

E. Dietzgen & Co., A. Ballin, Hamburg, 40 cs.

TISSUE PAPER

B. F. Drakenfeld & Co., Britannic, Liverpool, 1 cs.

Parsons & Whittemore, Inc., Britannic, Liverpool, 6 cs.

W. J. Byrnes, Mauretania, Southampton, 3 cs.

DECALCOMANIA PAPER

L. A. Consmiller, Europa, Bremen, 7 cs.

C. W. Sellers, Europa, Bremen, 14 cs.

B. F. Drakenfeld & Co., Britannic, Liverpool, 14 cs. (duplex); 3 cs. (simplex).

BARYTA COATED PAPER

Globe Shipping Co., Europa, Bremen, 23 crates, 1 cs.

GOLD COATED PAPER

F. Murray Hill Co., Berlin, Bremen, 3 cs.

METAL COATED PAPER

Globe Shipping Co., Berlin, Bremen, 53 cs.

K. Pauli Co., Berlin, Bremen, 5 cs.

K. Pauli Co., A. Ballin, Hamburg, 33 cs.

L. Uhlfelder & Co., A. Ballin, Hamburg, 1 cs.

PHOTO PAPER

J. J. Gavin, Mauretania, Southampton, 4 cs.

SURFACE COATED PAPER

Gevaert Co. of America, Westernland, Antwerp, 24 cs.

Globe Shipping Co., A. Ballin, Hamburg, 2 cs.

TRACING PAPER

Globe Shipping Co., A. Ballin, Hamburg, 1 cs.

STENCIL PAPER

Wedeman Godknecht & Lally, Inc., A. Ballin, Hamburg, 4 cs.

1st National Bank of Boston, A. Ballin, Hamburg, 6 cs.

WRITING PAPER

Simfred, Inc., Mauretania, Southampton, 3 cs.

WRITING PAPER AND ENVELOPES

State Forwarding Co., Mauretania, Southampton, 5 cs.

ENVELOPES

J. Beckhard & Co., Berlin, Bremen, 18 cs.

NOTE BOOKS

Keuffel & Esser Co., American Importer, Hamburg, 6 cs.

IVORY BOARDS

Coy Disbrow & Co. Inc., Rotterdam, Rotterdam, 15 pkgs.

PAPER BOARD

Colmar Paper Corp., Westernland, Antwerp, 10 cs.

ADHESIVE PAPER

Heemsoth Basse & Co., Rotterdam, Rotterdam, 5 cs.

WOOD PULP WADDING

Bendix Paper Co., Rotterdam, Rotterdam, 25 cs.

CARD BOARD

Coty Processing Co., De Grasse, Havre, 40 cs.

Guerlain Inc., De Grasse, Havre, 3 cs.

MISCELLANEOUS PAPER

Hensel Bruckman & Lorbacher, Berlin, Bremen, 8 cs.

Coy Disbrow & Co. Inc., Berlin, Bremen, 3 cs.

F. S. Lux, Bergensfjord, Gothenburg, 8 bls.

Japan Import & Export Commission Co., Pr. Jackson, Kobe, 3 cs.

Van Oppen & Co., De Grasse, Havre, 1 cs.

——, De Grasse, Havre, 17 cs.

RAGS, BAGGINGS, ETC.

Darmstadt Scott & Courtney, Schodack, Havre, 84 bls. bagging.

H. W. T. Mali & Co., Schodack, Dunkirk, 85 bls. flax waste.

V. Galaup, Schodack, Dunkirk,, 46 bls. rags.

——, Berlin, Bremen, 42 bls. rags.

C. Nelson, Port Pirie, Glasgow, 25 bls. new rags.

E. J. Keller Co. Inc., Innoko, ——, 56 bls. rags.

Irving Trust Co., Innoko, Antwerp, 225 bls. bagging.

G. W. Millar & Co. Inc., Innoko, Antwerp, 35 bls. rags.

Chemical Bank & Trust Co., A. Ballin, Hamburg, 31 bls. rags.

Continental Bank & Trust Co., A. Ballin, Hamburg, 42 bls. rags.

OLD ROPE

Chemical Bank & Trust Co., England Maru, Hamburg, 64 bls.

CHINA CLAY

L. A. Salomon & Bro., Britannic, Liverpool, 75 casks, 320 bags.

WOOD PULP

Johaneson Wales & Sparre, Inc., England Maru, Hamburg, 174 bls. wood pulp, 26 tons.

J. Andersen & Co., Greisheim, Kalix, 5000 bls. chemical pulp, 1016 tons.

Price & Pierce, Ltd., Griesheim Wallvik, 600 bls. sulphite, 100 tons.

Irving Trust Co., Berlin, Bremen, 702 bls. wood pulp.

Chemical Bank & Trust Co., Bergensfjord, Oslo, 800 bls. sulphite.

Irving Trust Co., Bergensfjord, Oslo, 150 bls. wood pulp.

——, Bergensfjord, Oslo, 125 bls. wood pulp.

E. J. Keller Co. Inc., Bergensfjord, ——, 250 bls. wood pulp.

Lagerloef Trading Co., Kolsnaren, Stockholm, 167 bls. sulphite.

Lagerloef Trading Co., Kolsnaren, Hango, 130 bls. sulphate.

Castle & Overton, Inc., Rotterdam, Rotterdam, 140 bls. wood pulp.

——, Olga Siemers, Hernosand, 480 bls. sulphate, 80 tons; 4950 bls. sulphite, 825 tons.

Bulkley Dunton & Co., Olga Siemers, ——, 9125 bls. wood pulp.

Johaneson Wales & Sparre Inc., Olga Siemers, Sundsvall, 3965 bls. sulphite, 764 tons; 250 bls. wood pulp, 101 tons.

Parsons & Whittemore Inc., Olga Siemers, Sundsvall, 1350 bls. wood pulp, 228 tons.

Castle & Overton Inc., A. Ballin, Hamburg, 140 bls. wood pulp, 28 tons.

E. J. Keller Co. Inc., American Importer, ——, 508 bls. wood pulp.

WOOD FLOUR

State Chemical Co., Rotterdam, Rotterdam, 1000 bags.

PHILADELPHIA IMPORTS

WEEK ENDING NOVEMBER 21, 1931

——, Markland, Liverpool, N. S., 2665 rolls news print.

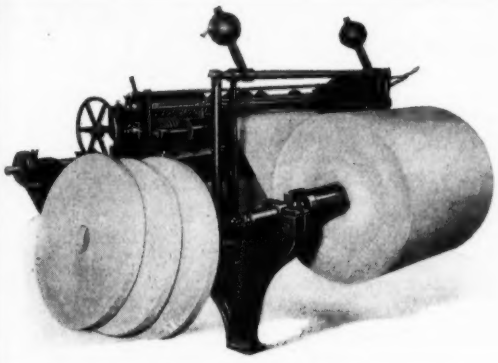
Brown Bros. Harriman & Co., City of Flint, Leith, 103 coils old rope.

E. J. Keller Co. Inc., Express, ——, 160 bls. rags.

E. J. Keller Co. Inc., Elmshorn, ——, 197 bls. wood pulp.

Bulkley Dunton & Co., Kersten Miles, ——, 2625 bls. wood pulp.

(Continued on page 56)



HEAVY DUTY SLITTER and REWINDER

Designed to meet the requirements of all users of Automatic Machines that take the stock from the roll, and require a roll of large diameter wound true and solid.

With this slitter, wide and narrow widths cut at the same time are of uniform tension. A roll slit and rewound 1" wide and 48" diameter can be handled without danger of spinning. At very little additional cost per ton paper mills equipped with this Slitter can furnish their customers with paper or board slit and rewound from 1" width and up. Made in three widths: 48"—60"—72".

INMAN MANUFACTURING COMPANY
AMSTERDAM, N. Y.

Manufacturers of
AUTOMATIC MACHINERY FOR PAPER BOXES AND ROTARY PAPER CUTTING MACHINERY

TI MACHINE SEMI-STEEL SECTIONAL BURRS

Manufactured in 3, 4, 5, 6 and 7 cuts per inch.

3" Diam.

SHARP — STRONG — TOUGH

ILLUSTRATION SHOWS ½ SIZE

OTHER SPECIALTIES

WARREN IMPROVED CALENDER With flexible blades, Universal Adjustment and Control, Patented — DOCTORS

WARREN IMPROVED DOUBLE DRUM— WINDER

BALL HYDRANT for Stock Circulating Systems — VALVES

AND OTHER PAPER MILL MACHINERY

MANUFACTURED BY
TICONDEROGA MACHINE WORKS
TICONDEROGA, N. Y.
SEND FOR BULLETINS—ASK FOR PRICES.

West Virginia Pulp and Paper Company

Manufacturers of

SUPERCALENDERED and MACHINE FINISHED BOOK and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing Cover and Music Paper, High Grade Coated Book, Index Bristol, Post Card, Kraft and Label Papers

also

Bleached Spruce Sulphite and Soda Kraft Pulp

230 Park Ave. New York — 35 East Wacker Drive Chicago
503 Market St., San Francisco, Cal.
Sixth and Chestnut Sts., Philadelphia, Pa.

PERMANENT COLORS

Browns Greens Reds Yellows

BROWNS
Oxides of Iron
Turkey Umbers

GREENS
Chromic Oxides
Guignet's Green

REDS
All types and shades of Oxides of Iron

YELLOWS
Ochres
Iron Hydroxides

Asbestines and Talcs for Fillers

C. K. WILLIAMS & CO.
EASTON, PA.

Imports of Paper and Paper Stock

(Continued from page 54)

ALBANY IMPORTS

WEEK ENDING NOVEMBER 21, 1931

Bonaventure Pulp & Paper Co., Dagali Chandler, P. Q., 9500 bls. sulphite pulp.

A. P. W. Paper Co., Pluto, Sheet Harbor, 1641 tons wood pulp.

BALTIMORE IMPORTS

WEEK ENDING NOVEMBER 21, 1931

Stora Kopparberg Corp., Griesheim, Skutskar, 2500 bls. wood pulp, 507 tons.

——, Griesheim, Gefle, 3125 bls. sulphite.

Pagel Horton & Co. Inc., Griesheim, Gefle, 5000 bls. sulphite.

——, Griesheim, Kalix, 5000 bls. wood pulp, 1016 tons.

Pagel Horton & Co. Inc., Griesheim, Husum, 6000 bls. sulphate, 1016 tons; 150 bls. sulphite, 25 tons.

Price & Pierce, Ltd., Griesheim, Hernosand, 1800 bls. sulphite, 300 tons.

J. Anderson & Co., Griesheim, Hernosand, 750 bls. sulphite, 125 tons; 600 bls. sulphate, 102 tons.

E. M. Sergeant & Co., Griesheim, Hernosand, 2100 bls. sulphate, 350 tons.

——, Griesheim, Hernosand, 900 bls. sulphate, 150 tons.

Price & Pierce, Ltd., Griesheim, Wallvik, 2250 bls. sulphite, 375 tons.

Acer & Co., Munindies, Port Alice, B. C., 7410 bls. wood pulp.

——, Kolsnaren, Wiborg, 680 bls. sulphate; 3200 bls. sulphite.

Bulkley Dunton & Co., Kolsnaren, ——, 2000 bls. wood pulp.

Castle & Overton Inc., Kolsnaren, Wiborg, 3535 bls. wood pulp.

Irving Trust Co., Kolsnaren, Wiborg, 960 bls. bls. sulphate.

Lagerloef Trading Co., Kolsnaren, Kotka, 520 bls. wood pulp.

Castle & Overton Inc., Maryland, London, 40 bls. waste paper.

Bank of Montreal, Cornerbrook, Cornerbrook, 6693 rolls news print.

Bulkley Dunton & Co., Gonzenheim, ——, 800 bls. wood pulp.

Bulkley Dunton & Co., Kersten Miles, ——, 9500 bls. wood pulp.

Parsons & Whittemore Inc., City of Baltimore, ——, 560 bls. wood pulp, sulphite.

Parsons & Whittemore Inc., Gonzenheim, ——, 625 bls. kraft pulp.

M. Gottesman & Co., Inc., Elza Menzell, Sweden, 10200 bls. wood pulp.

M. Gottesman & Co. Inc., Gonzenheim, Eweden, 1500 bls. wood pulp.

M. Gottesman & Co., Inc., Kersten Miles, Sweden, 10440 bls. wood pulp.

M. Gottesman & Co. Inc., Sac City, Germany, 550 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING NOVEMBER 21, 1931

——, Kolsnaren, Wiborg, 1872 bls. sulphite; 1218 bls. sulphate.

Castle & Overton Inc., Kolsnaren, Wiborg, 269 bls. wood pulp.

Jay Madden Corp., Kolsnaren, Kotka, 97 rolls news print.

W. M. Stone & Co., Kolsnaren, Kotka, 202 rolls news print.

Old Dominion Paper Co. Inc., Kolsnaren, Kotka, 94 rolls news print.

Lagerloef Trading Co., Kolsnaren, Kotka, 1073 bls. sulphite; 2010 bls. sulphate.

Lagerloef Trading Co., Kolsnaren, Hango, 959 bls. sulphite; 1040 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING NOVEMBER 21, 1931

Oxford University Press, Britannic, Liverpool, 5 cs. printing paper.

G. F. Malcolm & Co., Britannic, Liverpool, 44 cs. paper.

T. D. Downing & Co., Britannic, Liverpool, 2 cs. note paper and envelopes.

1st National Bank of Boston, Maryland, London, 67 bags casein.

Baring Bros. & Co., Maryland, London, 277 bls. waste paper.

Crocker Burbank & Co., Maryland, London, 345 bls. waste paper.

——, Maryland, London, 84 bls. paper stock; 18 coils old rope.

Bulkley Dunton & Co., Consul Corfitzon, ——, 2400 bls. wood pulp.

PORTLAND IMPORTS

WEEK ENDING NOVEMBER 21, 1931

M. Gottesman & Co. Inc., Boren, Sweden, 5000 bls. wood pulp.

M. Gottesman & Co. Inc., Roxen, Sweden, 10160 bls. wood pulp.

M. Gottesman & Co. Inc., Gonzenheim, Sweden, 1540 bls. wood pulp.

Canadian Pulp and Paper Exports Decline

Canadian exports of pulp and paper in September were valued at $11,084,365, according to the report issued by the Canadian Pulp and Paper Association. This was a decrease from the previous month of $101,184.

Wood-pulp exports for the month were valued at $2,330,276 and exports of paper at $8,754,089, as compared with $2,502,372 and $8,683,177 respectively in the month of August.

Details for the various grades of pulp and paper are as follows:

	September, 1931		September, 1930	
	Tons	$	Tons	$
PULP:				
Mechanical	20,417	560,052	22,544	636,667
Sulphite bleached	21,935	1,355,081	20,577	1,438,766
Sulphite unbleached	2,919	227,236	13,980	687,713
Sulphate	2,635	159,454	6,578	422,047
Screenings	858	14,139	1,745	30,940
All other	279	14,314	737	59,564
	52,043	2,330,276	66,161	3,275,697
PAPER:				
News print	161,171	8,445,920	194,820	10,909,298
Wrapping	613	54,954	1,170	129,160
Book (cwts.)	1,575	12,212	2,963	26,395
Writing (cwts.)	.....	.....	86	531
All other	.....	241,003	.....	238,664
	.....	8,754,089	.....	11,304,048

For the first nine months of the year exports of pulp and paper were valued at $106,631,891. In the corresponding months of 1930 the value was $133,696,935 so that there has been a decrease this year of $27,065,044.

Details for the various grades are given below:

	9 Mos., 1931		9 Mos., 1930	
	Tons	$	Tons	$
PULP:				
Mechanical	119,327	3,414,232	146,752	4,247,969
Sulphite bleached	190,677	12,087,102	191,101	13,993,036
Sulphite unbleached	92,457	3,956,824	146,354	7,286,538
Sulphate	62,940	2,547,136	67,949	3,988,124
All other	13,425	338,416	21,621	611,687
	478,826	22,343,710	537,777	30,127,354
PAPER:				
News print	1,504,225	81,421,010	1,731,591	99,619,898
Wrapping	7,294	673,336	10,531	1,106,109
Book (cwts.)	19,466	162,397	29,535	277,496
Writing (cwts.)	1,300	12,003	2,101	17,957
All other	.....	2,019,435	.....	2,548,121
	.....	84,288,181	.....	103,569,581

Pulpwood exports for the first nine months of this year were 765,046 cords valued at $7,498,193, as compared with 1,107,159 cords valued at $11,221,892 in the corresponding months of last year.

E. M. Davenport Honored for Long Service

Edward M. Davenport, treasurer of Spaulding & Tewksbury Company, box board dealers, had luncheon with his co-workers in the office of the company at the Boston Chamber of Commerce November 9 and the occasion was in recognition of fifty years of service with the firm. Mr. Davenport was the recipient of many felicitations and congratulations. He is hale and hearty and speaks cheerfully of the future of the paper board industry.

Mr. Davenport gave reminiscences of the earlier days —those of the air-dried straw-boards and 1000-ton orders. He also described the method of going after orders in the days before automobiles and telephones. He recalled that he was accustomed to engage a horse and sleigh to make runs of twenty to thirty miles in calling on the trade in out-of-the-way places in New England and points in Eastern States. Mr. Davenport's travels included trips as far west as St. Louis.

Following the luncheon the party adjourned to the stockroom adjoining the office of the company at 232 Summer street, where they saw an exhibition of amateur moving pictures, taken by Edwin Kleberg, which included some intimate views of various ones connected with the concern. Mr. Davenport's many friends wish him well.

GEORGE F. HARDY

Consulting Engineer

305-309 Broadway, New York City, N. Y.

Member—Am. Soc. C.E.—Am. Soc. M.E.—Eng. Inst. Can.

Consultation	Paper and Pulp Mills
Reports	Hydro-Electric and
Valuations	Steam Power Plants
Estimates	Plans and Specifications

Hardy S. Ferguson & Co.

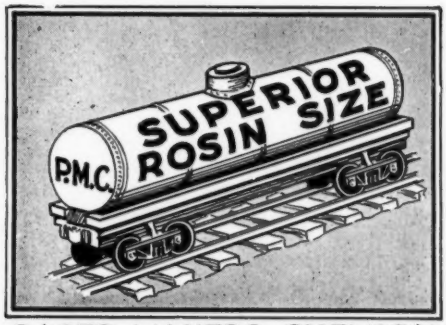
Consulting Engineers

200 Fifth Avenue New York City

Hardy S. Ferguson.....Member A.S.C.E., A.S.M.E., E.I.C.
Moses H. Teaze .....Member A.S.M.E., E.I.C.
J. Wallace Tower .....Member A.S.C.E., A.S.M.E.

Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of

Pulp and Paper Mills and other Industrial Plants.
Steam and Hydro-electric Power Plants
Dams and other Hydraulic Structures.



20 plants to serve You

PAPER MAKERS CHEMICAL CORP.
Kalamazoo, Michigan

TRIMBEY MACHINE WORKS

GLENS FALLS, N. Y.

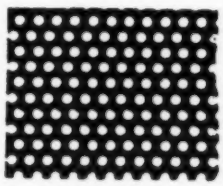
Manufacturers of

WEIGHT REGULATORS
CONSISTENCY REGULATORS
PROPORTIONING AND METERING SYSTEMS
PULP SCREENS—FLOAT VALVES

Perforated Metal Screens

For Pulp and Paper Mills

STEEL, COPPER, BRASS, BRONZE, MONEL METAL and other Alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.



".065" Round

CHARLES MUNDT & SONS
63-65 FAIRMONT AVE. JERSEY CITY, N. J.

KELLOGG *Masterweld*

DUCTILE TOUGH

DIGESTERS

Boiler Drums • Headers • Receivers
Separators and Complete
Power Plant Piping

THE M. W. KELLOGG COMPANY
225 Broadway, New York City, and at Birmingham
Boston, Chicago, Los Angeles, Tulsa

All Kellogg Welded Products Are Insurable

GIANT

RAGS — BURLAP
BAGGING — ROPE
JUTE BUTTS, MAGAZINES, CATALOGS OLD PAPERS, THREAD WASTE AND ALL GRADES OF RAGS CUT QUICKLY AND EFFICIENTLY WITH THE

TAYLOR, STILES & COMPANY GIANT REG. U.S. PAT. OFF. RIEGELSVILLE, N.J. U.S.A.

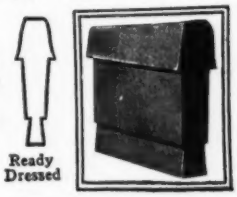
This is the GIANT 2A CUTTER WITH A CAPACITY OF 3000 lbs. PER HOUR
GIANT RAG CUTTERS HAVE CAPACITIES OF FROM 1 to 5 tons per hour.

THE STANDARD OF THE WORLD FOR 60 YEARS
TAYLOR, STILES & COMPANY
RIEGELSVILLE, N. J.
CANADIAN REPRESENTATIVES
Waterous Engine Works Company, Ltd., Brantford, Ont., Canada
SOLE AGENTS FOR EUROPE
R. J. Marx, 133-139 Finsbury Pavement, London, E. C.

"READY DRESSED" MILL COGS

LABOR SAVING—TIME SAVING

THE MOST ECONOMICAL FILLING THAT CAN BE PUT IN A MORTISE WHEEL



Ready Dressed

Blank Head

WE MAKE ANY STYLE OR SIZE WANTED

WRITE FOR INSTRUCTION SHEET "C" WHICH IS FREE

QUICK SERVICE ON ALL SIZES
THE N. P. BOWSHER CO., So. Bend, Ind.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, November 25, 1931.

Trading in the local paper market was only moderately active during the past week. While the prevailing demand for the various standard grades of paper is below normal for the time of year, however, there are a number of inquiries around, some of which should materialize into good business. Prices continue irregular, although no radical changes have been reported.

News print operations in the United States and Canada are still being maintained at approximately 56 per cent of rated capacity. Shipments are going forward in fairly satisfactory volume for the season. Strenuous efforts are being made to stabilize the industry in some quarters and negotiations for the consolidation of big units are going on.

Northern paper board mills are operating at 70 per cent of capacity. The downward trend in folding box sales has been offset by business afforded through the production of new types of packages. Demand for the various grades of fine paper is fairly active. Tissues are going forward in seasonal volume. The coarse paper market is spotty and the price situation unsatisfactory.

Mechanical Pulp

Production of ground wood pulp at home and abroad is being maintained in sufficient volume to take care of current requirements. There are no undue accumulations and the industry is in a sound statistical position. Inquiries for future delivery are fairly numerous. Prices are generally holding to previously quoted levels.

Chemical Pulp

Some improvement was noticed in the demand for imported and domestic chemical pulp during the past week. In some quarters the better trend is attributed to the prospects of a Swedish pulp mill workers' strike beginning January next year. Inquiries for 1932 delivery are becoming more frequent and the outlook is more encouraging than for some time past.

Old Rope and Bagging

The old rope market continues quiet. Paper mill demand for both domestic and imported old manila rope is restricted and it is believed that the plants making old rope papers are well stocked with raw materials. Small mixed rope is dull. Demand for scrap and gunny bagging is light and the request for roofing bagging has fallen off.

Rags

Conditions in the domestic rag market are practically unchanged. Demand for cotton cuttings is listless and little interest is being shown in the roofing grades at present. Mixed rags are quiet. Prices are generally weak. The imported rag market is still in an uncertain position, due to fluctuations in foreign exchange, and prices are nominal.

Waste Paper

The paper stock market is less active than of late. Board mill demand for the lower grades has subsided somewhat, although No. 1 mixed paper and strictly folded news are fairly steady. Some of the better grades are showing more activity, especially book stock, which is slightly firmer. On the other hand, soft and hard white shavings are easier.

Twine

Steadiness continues to prevail in the local twine market. Sales of the various grades booked during the past week were well up to the average of the corresponding period of the preceding year. There are some inquiries for future needs around. Prices are generally holding to schedule and the future outlook is promising.

Boston Paper Trade Happenings

BOSTON, Mass., November 23, 1931—A sales meeting of the Storrs & Bement Company, paper wholesalers, was held at the office of the firm, 280 Congress street, Friday evening, with representatives of the S. D. Warren Company, manufacturers, present. William N. Statson, Jr., president, and John H. Brewer, general manager, both of Storrs & Bement Company, presided. The mutual business of the two companies was discussed. The S. D. Warren Company was represented by Clyde Morgan, treasurer; O. M. Curtis, manager of sales activities, and Watson Gordon, advertising manager.

The Millers Falls Paper Company, Millers Falls, Mass., has appointed John Carter & Co., Inc., and Storrs & Bement Company, distributors of Goshen Ledger in the Boston territory.

Henry L. Goodman, accompanied by Robert A. Ford, who is associated with him, went to Holyoke, Mass., Tuesday, spending considerable time with the Marvellum Company in that city. They brought back some very fine specialties suitable for the greeting card trade.

J. P. Massie, vice-president of the Albemarle Paper Manufacturing Company, was in town last week, calling on the trade.

Cleveland Paper Co. Celebrates

Celebrating its sixth anniversary under new management this month, the Cleveland Paper Company, originally founded in 1893 as a fine paper house, gave wide publicity to the event through a page spread in the rotogravure section of the *Cleveland News*, Sunday, November 1.

The page was replete with pictures of the personnel, exterior and interior views of their offices and warehouse. A brief history of the Cleveland Paper Company from establishment to present day was also featured.

A. H. Seyler, president, announces the appointment of A. T. Miller, former executive with General Outdoor Advertising Company, as sales and promotion manager. Mr. Miller, a former resident of Cleveland, came direct from Louisville, Ky., to take up his new duties. He was president of the Louisville Advertising Club for the past year and is also an ex-president of the Nashville Advertising Club.

WOOD PULP
AGENTS

PRICE & PIERCE, Ltd.,

60 EAST 42nd ST.
NEW YORK

Glens Falls Machine Works

GLENS FALLS, N. Y.

Manufacturers of

IMPROVED ROGERS AND SPECIAL WET MACHINES

STANDARD WET MACHINES

GLENS FALLS ROLLING ACTION FLAT SCREEN

THE A. D. WOOD SAVEALL, THICKENER, WASHER AND WATER SCREEN

GLENS FALLS DECKER AND DECKER WASHER

GLENS FALLS ROTARY SULPHUR BURNER

PULP GRINDERS, THREE OR FOUR POCKET (Roller Bearings)

Ask us about the
OLIVER-ROGERS WET MACHINE

EXTENSION MODEL

Cambridge Surface Pyrometer

is an instrument which applied to the surface of a dryer or calender roll, instantly indicates the exact surface temperature. Its use enables the operator to locate water logged rolls and to maintain every roll at the correct temperature for efficient progressive drying.

The instrument is compact, rugged and easy to read. The extension rod permits temperature checking across the entire roll. Scale ranges are 50-250° and 50-400°F.

Send for List No. 194-P.T.

CAMBRIDGE INSTRUMENT CO., INC.
3512 GRAND CENTRAL TERMINAL, NEW YORK

DAYTON BEATERS
HIGH SPEED

The Dayton Beater & Hoist Co.
DAYTON, OHIO

Eastern Representative
MANSFIELD, BOLTON & KENT
501 Fifth Ave.,
New York, N. Y.

Western Representative
F. H. GODFREY
415 Lenora St.,
Seattle, Wash.

SENSITIVE
ACCURATE
SIMPLE
DEPENDABLE

THE
MEYERS-MESCO
CONSISTENCY REGULATOR
ONE OF FOUR VALUABLE CONTROLS MANUFACTURED BY
MERRITT ENGINEERING & SALES CO.
LOCKPORT, N. Y.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, November 25, 1931.

BLANC FIXE.—Trading in the blanc fixe market was moderately active during the past week. Prices remain unchanged. The pulp is quoted at from $42.50 to $45 per ton, while the powder is selling at from 3¾ cents to 4½ cents per pound, in barrels, at works.

BLEACHING POWDER.—The bleaching powder market is exhibiting a strong undertone. Contract shipments are moving in satisfactory volume. Prices are holding to schedule. Bleaching powder is quoted at from $1.75 to $2 per 100 pounds, in drums, at works.

CASEIN.—Quietness reigns in the casein market. Domestic standard ground is quoted at 7½ cents and finely ground at 8 cents per pound. Argentine standard ground is selling at 8½ cents and finely ground at 9½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Steadiness prevails in the caustic soda market. Prices generally remain unchanged. Solid caustic soda is quoted at from $2.50 to $2.55; while the flake and the ground are selling at from $2.90 to $2.95 per 100 pounds, in large drums, at works.

CHINA CLAY.—Signs of improvement were noticed in the china clay market. The contract movement is fairly heavy. Imported china clay is still quoted at from $11 to $13 per ton. Domestic paper making clay is selling at from $7 to $11 per ton, at mine.

CHLORINE.—The chlorine market is displaying a steady trend. Shipments against contract are going forward with regularity. Prices are holding to schedule. Chlorine is quoted at $1.75 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—Firmness again characterized the rosin market. The grades of gum rosin used in paper mills are now quoted at from $4.25 to $4.50 per 280 pounds, in barrels, at works. Wood rosin is selling at $4.00 per 280 pounds, in barrels, on dock.

SALT CAKE.—The salt cake market continues dull. Demand is mostly routine. Salt cake is still quoted at from $15 to $16; chrome salt cake at from $13 to $14 per ton, in bulk, at works. Imported salt cake is selling at from $15 to $15.50 per ton, ship side.

SODA ASH.—Demand for soda ash is fairly persistent. Contracts are being booked for next year at the levels now prevailing. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1; in bags, $1.25; and in barrels, $1.38.

STARCH.—The starch market continues to exhibit a strong undertone. Demand from the paper mills is normal and prices are well maintained. Special paper making starch is quoted at $2.77, in bags; and at $3.04, in barrels, per 100 pounds, at works.

SULPHATE OF ALUMINA.—Production of sulphate of alumina is being maintained in sufficient volume to take care of current needs. Commercial grades are quoted at from $1.25 to $1.49; iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market is steady. Sulphur is quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton for any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Most of the business transacted in the talc market during the past week was along routine lines. Domestic talc is still quoted at from $16 to $18 per ton, in bulk, at mine; while imported talc is selling at from $18 to $22 per ton, in bags, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	7.50	@38.00
Bonds	6.00	@53.25
Writings—		
Extra Superfine	14.00	@32.00
Superfine	14.00	@32.00
Tub sized	10.00	@15.00
Engine sized	6.75	@11.00
Book, Cased—		
S. & S. C.	5.25	@ —
M. F.	5.00	@ —
Coated and Enamel	6.75	@10 25
Lithograph	7.25	@11.75
Tissues—Per Ream—		
White No. 1	.65	@ .70
Anti-Tarnish M. G. only	.65	@ .70
Colored	.70	@ .90
White No. 2	.55	@ .60
Kraft	.65	@ .70
Manila	.55	@ .60
Manila—		
No. 1 Jute	9.00	@ 9.25
No. 2 Jute	7.75	@ 8.50
No. 1 Wood	4.00	@ 5.25
No. 2 Wood	3.50	@ 4.00
Butchers	3.37½	@ —
Fibre Papers—		
No. 1 Fibre	4.25	@ 5.50
No. 2 Fibre	4.00	@ 4.75
Common Bogus	1.50	@ 3.00
Screenings	2.00	@ 3.00
Card Middles	4.00	@ 5.00
Glassine—		
Bleached, basis 25 lbs., No. 1	.09¼	@ —
No. 2	.11¼	@ —
Bleached, basis 20 lbs.	.11¼	@ —
(Delivered New York)		
News, per ton—		
Rolls, contract	57.00	@ —
Rolls, spot	57.00	@ —
Sheets	62.00	@ —
Side Runs	42.00	@46.00
Kraft—		
No. 1 Domestic	4.50	@ 5.75
No. 2 Domestic	3.00	@ 4.25
Southern	2.75	@ 4.00
Imported	6.00	@ 7.00
Boards—per ton—		
News	24.00	@27.50
Straw	11.50	@15.00
Chip	24.00	@27.50
Binders' Boards	62.00	@70.00
Standard 85 Test Liner	32.50	@35.00
Sgl. Mla. Ll. Chip	37.50	@42.50
(F. o. b. Mill)		
Wood Pulp Boards	70.00	@80.00

Mechanical Pulp

(On Dock)

No. 1 Imported—		
Moist	24.00	@26.00
Dry	25.00	@26.50
(F. o. b. Mill)		
No. 1 Domestic	25.00	@30.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	2.25	@ 3.25
Easy Bleaching	2.00	@ 2.10
No. 1 strong unbleached	1.70	@ 2.00
Mitscherlich unbleached	1.80	@ 2.00
No. 2 strong unbleached	1.55	@ 1.70
No. 1 Kraft	1.50	@ 1.75
No. 2 Kraft	1.40	@ 1.50
Sulphate—		
Bleached	2.75	@ 3.25
(F. o. b. Pulp Mill)		
Sulphite (Domestic)—		
Bleached	2.25	@ 4.50
Easy Bleaching	2.15	@ 2.35
News	1.80	@ 2.50
Mitscherlich	2.40	@ 2.55
Kraft (Domestic)	1.60	@ 2.75
(Delivered Paper Mills)		
Soda Bleached	2.75	@ —

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1	5.50	@ 6.00
New White, No. 2	4.50	@ 5.00
Silesias No. 1	4.50	@ 4.75
New Unbleached	6.00	@ 6.50
New Blue Prints	3.50	@ 4.00
New Soft Blacks	3.50	@ 4.00
Blue Overall	4.50	@ 4.75
Fancy	2.50	@ 2.75
Washables	2.25	@ 2.50
Mixed Khaki Cuttings	3.00	@ 3.25
Pink Corset Cuttings	4.00	@ 4.50
O. D. Khaki Cuttings	4.50	@ 4.75
Men's Corduroy	2.25	@ 2.50
New Mixed Blacks	2.75	@ 3.00

Old Rags

White, No. 1—		
Repacked	4.50	@ 5.00
Miscellaneous	3.75	@ 4.25
White No. 2—		
Repacked	2.50	@ 3.00
Miscellaneous	2.00	@ 2.25
St. Soiled White	1.50	@ 1.75
Thirds and Blues—		
Repacked	1.80	@ 2.15
Miscellaneous	1.65	@ 1.75
Black Stockings	2.75	@ 3.00
Roofing Rags—		
Cloth Strippings	.65	@ .70
No. 1	.70	@ .75
No. 2	.45	@ .50
No. 3	.40	@ .45
No. 4	.40	@ .45
No. 5A	.35	@ .40

Foreign Rags

New Rags

New Dark Cuttings	1.60	@ 1.75
New Mixed Cuttings	1.75	@ 1.85
New Light Sileasias	4.00	@ 4.25
Light Flannelettes	4.00	@ 4.25
Unbleached Cuttings	6.00	@ 6.25
New White Cuttings	5.00	@ 5.25
New Light Oxfords	4.00	@ 4.25
New Light Prints	2.75	@ 3.00

Old Rags

No. 1 White Linens	5.75	@ 6.00
No. 2 White Linens	4.75	@ 5.00
No. 3 White Linens	3.50	@ 3.75
No. 4 White Linens	2.00	@ 2.50
No. 1 White Cotton	4.00	@ 4.25
No. 2 White Cotton	3.25	@ 3.50
No. 3 White Cotton	2.50	@ 3.00
No. 4 White Cotton	1.45	@ 1.60
Extra Light Prints	1.90	@ 2.10
Ord. Light Prints	1.60	@ 1.75
Med. Light Prints	1.40	@ 1.55
Dutch Blue Cottons	1.50	@ 1.60
French Blue Linens	2.25	@ 2.40
German Blue Linens	2.00	@ 2.10
German Blue Cottons	1.35	@ 1.40
Checks and Blues	1.25	@ 1.30
Lindsay Garments	.85	@ .90
Dark Cottons	.65	@ .70
Old Shopperies	.60	@ .65
New Shopperies	.55	@ .60
French Blues	1.40	@ 1.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—		
Foreign	1.35	@ 1.40
Domestic	1.50	@ 1.55
Wool Tares, light	1.05	@ 1.10
Wool Tares, heavy	1.05	@ 1.10
Bright Bagging	1.00	@ 1.05
Small Mixed Rope	.85	@ .90
Manila Rope—		
Foreign	1.55	@ 1.60
Domestic	1.75	@ 1.90
New Burlap Cut	1.70	@ 1.80
Hessian Jute Threads—		
Foreign	2.60	@ 2.75
Domestic	2.80	@ 3.00

Old Waste Papers

(F. o. b. New York)

Shavings—		
Hard, white, No. 1	2.50	@ 2.60
Hard, white, No. 2	2.10	@ 2.20
Soft, white, No. 1	2.00	@ 2.10
White envelope cuttings	2.25	@ 2.40
Flat Stock—		
Stitchless	.70	@ .80
Overissue Mag	.70	@ .80
Solid Flat Book	.60	@ .70
Crumpled No. 1	.48	@ .53
Solid Book Ledger	1.75	@ 1.85
Ledger Stock	.65	@ .75
New B. B. Chips	.20	@ .30
Manilas—		
New Env. Cut	1.75	@ 1.85
New Cuttings	1.40	@ 1.50
Extra No. 1 old	1.10	@ 1.25
Print	.45	@ .50
Bogus Wrapper	.45	@ .50
Container	.30	@ .35
Old Kraft Machine—		
Compressed bales	1.10	@ 1.20
News—		
No. 1 White News	1.60	@ 1.65
Strictly Overissue	.35	@ .45
Strictly Folded	.33	@ .38
No. 1 Mixed Paper	.25	@ .30
Common Paper	Nominal	

JOHNSON & WIERK
INCORPORATED
CONSULTING ENGINEERS
For Paper Mills
GRAND CENTRAL TERMINAL BLDG., NEW YORK

De Laval
Steam Turbine Co., Trenton, N.J.
Steam Turbines, for all speed and steam conditions; capacities up to 15,000 hp. Catalog D45. Helical Gears. Catalog R45. Centrifugal Pumps, for all capacities. Catalog B45. Centrifugal Blowers and Compressors. Catalog F-45. Worm Reduction Gears. Catalog R45. Flexible Couplings. Catalog K45. Water Wheels. Catalog T45.

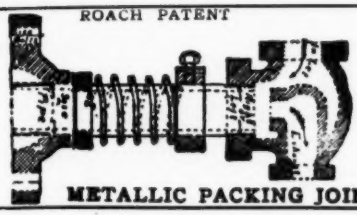
"THE FOURDRINIER THAT TOOK THE IRE OUT OF WIRE"
INTERNATIONAL WIRE WORKS
Menasha. Wisconsin

Appleton Wires
are good wires
APPLETON WIRE WORKS INC., APPLETON WIS.

UNION TALC CO.
TALC & AGALITE
FILLERS for PAPER
147 Nassau Street, New York

Perforated Metal Screens
for every purpose
also elevator buckets of all kinds; chutes; hoppers; stacks and tanks.
MITCO Products — Interlocked Steel Grating; Shur-Site Stair Treads; Armorgrids.
HENDRICK MANUFACTURING CO.
50 Dundaff St., Carbondale, Pa.
Offices in Principal Cities

KARL A. LEFREN, Inc.
CONSULTING ENGINEERS
171 Madison Ave. New York City

ROACH PATENT

Mfg. by the
RELIABLE
MACHINE CO.
ANDERSON, IND.
METALLIC PACKING JOINT FOR DRYERS

FREDERICK L. SMITH
21 EAST 40TH STREET, NEW YORK
PULP AND PAPER MILL ENGINEER

ROSS SYSTEMS
HEATING—VENTILATING—DRYING
J. O. ROSS ENGINEERING CORPORATION
201 North Wells Street CHICAGO
122 East 42nd St. NEW YORK
311 Lewis Building PORTLAND, ORE.

JAMES W. SEWALL
CONSULTING FORESTRY
JAMES W. SEWALL
Old Town
Maine
PHILLIPS & BENNER
Rattan Block
Port Arthur, Ontario

E. D. JONES & SONS CO.,
PITTSFIELD, MASS.
MANUFACTURERS OF
PAPER MILL MACHINERY

Wood and Tile
TANKS
of every description by your industry's foremost tank builder. Why not call in a specialist?
Kalamazoo Tank & Silo Co.
Kalamazoo Michigan

ANALYSES *and* TESTS *of*
PAPER, PULP AND PAPER-MAKING MATERIALS
FIBER ANALYSES SPECIFICATIONS
OFFICIAL PULP SAMPLING AND TESTING
Arthur D. Little, Inc.
Analytical Department
30 CHARLES RIVER ROAD, CAMBRIDGE, MASS.

ADDING MACHINE ROLLS
CASH REGISTER ROLLS
TELETYPE ROLLS
CARBON ROLLS
GUMMED SEALING ROLLS
PAPER MANUFACTURERS CO., INC.
Philadelphia, Pa.

Wisconsin Wire Works
FOURDRINIER WIRES
ROLLED WIRES, CYLINDER AND WASHER WIRES
APPLETON, WIS.

Twines

(F. o. b. Mill)

Cotton—			
B. C., 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finished Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	.13	@	—
No. 2	.11	@	—
Tube Rope—			
4-ply and larger	.09	@	—
Fine Tube Rope—			
4-ply	.11	@	—
3-ply	.12	@	—
2-ply	.13	@	—
Paper Makers Twine Balls	.07	@	—
Box Twine, 2-3 ply	.07	@	.08
Jute Rope	.09	@	.10
Amer. Hemp, 6	.27	@	.29
Java Sisal—			
No. 1 Basis	.10	@	—
No. 2 Basis	.09	@	—
New Zealand Sisal	.10	@	—
Sisal Lath Yarn—			
No. 1	.12	@	.14
No. 2	.10	@	.12
Manila Twine	.21	@	.22

CHICAGO

Paper

(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.06¼	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.08½	@	.12
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¼	@	.07¼
No. 2 S.&S.C. Book	.05¼	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¼
No. 1 Fibre	.04¼	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.04	@	.04½
No. 1 Kraft	4.50	@	5.00
Southern Kraft	3.00	@	3.25
No. 2 Kraft	3.00	@	3.25
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¾
Manila Tissue	.07	@	.07¼
White Tissue	.07¼	@	.07½
(Delivered Central Territory)			
News, per ton—			
Rolls, contract	57.00	@	—
Sheets	62.00	@	—
Boards, per ton—			
Plain Chip	30.00	@	35.00
Solid News	32.50	@	37.50
Manila Lined Chip	40.00	@	45.00
Container Lined—			
85 Test	50.00	@	55.00
100 Test	55.00	@	60.00

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 Hard White	1.95	@	2.05
No. 1 Soft White	1.80	@	1.90
Ledger & Writings	.60	@	.70
Solid Books	.60	@	.70
Blanks	1.40	@	1.55
Krafts	1.15	@	1.25
New Kraft Cuts	1.30	@	1.45
Manila Env. Cuts	1.40	@	1.50
Ex. No. 1 Manila	1.25	@	1.30
Print Manila	.40	@	.45
Overissue News	.40	@	.50
Old Newspapers—			
No. 1	.35	@	.45
No. 2	.30	@	.35
Mixed Papers—			
No. 1	.25	@	.30
No. 2	.20	@	.25
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper

(F. o. b. Mill)

Bonds	.05	@	.40
Ledgers	.07	@	.40
Writings—			
Superfine	.12	@	.18
Extra fine	.16	@	.22
Fine	.15	@	.26
Fine, No. 2	.12	@	.25
Fine, No. 3	.07	@	.20
ook, M. F	.04¼	@	.07
Book, S. S. & C	.05	@	.07½
Book, Coated	.07	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.07	@	.09
Manila Sul., No. 1	.03¼	@	.05½
Manila No. 2	.03	@	.04
No. 1 Kraft	.05¼	@	.06
No. 2 Kraft	.03¾	@	.04¼
Southern Kraft No. 1	.03	@	.03½
Southern Kraft No. 2	.02½	@	.02⅞
Common Bogus	.03	@	.04
(Delivered Philadelphia)			
News Print Rolls	58.00	@	62.00
Straw Board	50.00	@	—
News Board	30.00	@	32.00
Chip Board	25.00	@	27.50
Wood Pulp Board	75.00	@	85.00
Binder Boards—			
No. 1, per ton	73.00	@	75.00
No. 2, per ton	63.00	@	65.00
Carload lots	62.00	@	67.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.06	@	.06½
New White, No. 2	.05	@	.05½
Light Silesias	.05	@	.05½
Silesias, No. 1	.06	@	.08
Black Silesias, soft	.05	@	—
New Unbleached	.06	@	.06½
Washable, No. 1	.02½	@	.03
Blue Overall	.05	@	.05½
Cottons—According to grades—			
Washable, No. 2	.02	@	.02½
New Blue	.02	@	.02½
Fancy	.03	@	.03¼
New Black Soft	.03	@	.03½
New Light Seconds	.01¾	@	.02
New Dark Seconds	1.85	@	2.00
Khaki Cuttings—			
No. 1 O. D.	.04½	@	.05
No. 2 Mixed	.03½	@	.04
Corduroy	.02½	@	.03
New Canvas	.06½	@	.07
New Black Mixed	.03	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	3.50	@	4.00
Miscellaneous	2.25	@	2.75
M. G.	4.50	@	—
Thirds and Blues—			
Miscellaneous	1.25	@	1.50
Repacked	1.75	@	2.00
Black Stockings (Export)	3.80	@	4.00
Roofing Stock—			
Foreign No. 1	1.15	@	1.25
Repacked	.80	@	.90

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.60
Domestic	1.75	@	—
Manila Rope	2.25	@	2.50
Sisal Rope	1.25	@	1.50
Mixed Rope	1.10	@	1.25
Scrap Burlaps—			
No. 1	1.50	@	1.60
No. 2	1.10	@	1.20
Wool Tares, heavy	3.00	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.50	@	2.75
New Burlap Cuttings	2.00	@	2.25

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.00	@	2.25
No. 2 Hard White	1.75	@	1.90
No. 1 Soft White	1.75	@	2.00
No. 2 Soft White	1.40	@	1.50
No. 1 Mixed	.75	@	.80
No. 2 Mixed	.50	@	.55
Solid Ledger Stock	1.25	@	1.40
Writing Paper	.60	@	.80
No. 1 Books, heavy	.55	@	.60
No. 2 Books, light			Normal
No. 1 New Manila	1.50	@	1.65
No. 1 Old Manila	1.25	@	1.30
Print Manila	.40	@	.45
Container Manila	.35	@	.40
Old Kraft	1.10	@	1.20
Common Paper	.22½	@	.27½
No. 1 Mixed Paper	.22½	@	.27½
Straw Board, Chip	.30	@	.35
Binders Board, Chip	.30	@	.35
Corrugated Board	.45	@	.50
Overissue News	.50	@	.55
Old Newspaper	.30	@	.35

BOSTON

Paper

(F. o. b. Mill)

Ledgers—			
Sulphite	—	@	.06¼
Rag Content	.15	@	.30
All Rag	.38	@	.52½
Bonds—			
Sulphite	—	@	.06½
Rag content	.15	@	.30
All rag	.36½	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.0ō	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04½	@	.05¾
No. 2 Kraft	—	@	.03
(F. o. b. Boston)			
Southern Kraft	—	@	.02¾
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)			
Common Bogus	.02	@	.02¾
(Delivered New England points)			
News Print, rolls	—	@	56.50
Straw Board, rolls	.009	@	52.50
Straw Board in Sheets, basis 35s to 70s	—	@	50.00
Filled News Board	.27.50	@	30.00
Chip Board	.27.50	@	—
Chip Board (Creasing)	.27.50	@	30.00
Single Manila Lined Chip	.40.00	@	45.00
Single White, Patent Coated News Board—Binder	.52.50	@	60.00
Wood Pulp Board	.70.00	@	75.00
Binder Boards	.67.50	@	75.00

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.75	@	3.50
No. 2 Hard White	2.25	@	2.50
No. 1 Soft White	1.90	@	2.10
No. 2 Mixed	.60	@	.65
No. 1 Mixed	.90	@	1.00
Solid Ledger Books	1.75	@	2.00
Overissue Ledger Stock	1.35	@	1.60
Mixed Ledgers	1.15	@	1.30
No. 1 Books, heavy	.65	@	.75
No. 1 Books, light	—	@	.45
Crumpled Stitchless Book Stock	1.00	@	1.25
Manila Env. Cuttings	1.85	@	2.00
No. 1 Old Manila	—	@	1.00
White Blank News	1.50	@	1.60
Kraft No. 1	100	@	1.10
Manila	.90	@	1.00
No. 1 Mixed Paper	.20	@	.25
Print Manila	.40	@	.45
Overissue News	.40	@	.45
Old Newspapers	.27½	@	.35
Box Board, Chip	.20	@	.25
Corrugated Boxes	.35	@	.45

Bagging

(F. o. b. Boston)

Gunny No. 1—			
Foreign	—	@	1.25
Domestic	1.15	@	1.30
Manila Rope—			
Foreign	1.50	@	1.75
Domestic	1.75	@	2.00
Transmission Rope	1.25	@	1.40
Mixed String	.35	@	.40
Jute Rope	.90	@	1.00
Jute Carpet Threads	.75	@	.90
Bleachery Burlap	2.50	@	2.75
No. 1 Scrap Burlap	.90	@	1.10
Scrap Sisal	1.15	@	1.30
Scrap Sisal for shredding	1.25	@	1.50
Wool Tares, heavy	1.00	@	1.10
New Burlap Cutting	1.50	@	1.25
Australian Pouches	1.50	@	1.75
Heavy Baling Bagging	1.50	@	1.60
Paper Mill Bagging	.80	@	.90
Bagging No. 2	.50	@	—
No. 1 Burlap	—	@	3.50

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New White No. 1	.05	@	.05¾
New White No. 2	—	@	.05
Silesias No. 1	.06	@	.0[illegible]
New Black Silesias	.02½	@	.02¾
New Unbleached	—	@	.06
Fancy	.03	@	.03½
Washable	.03	@	.03½
Cottons—Aggregates—			
Blue Overalls	.05	@	.06
New Black, soft	.04	@	.04¼
Khaki Cuttings	.04	@	.04½
O. D. Khaki	.04½	@	.05
Corduroy	.03	@	.03½
New Canvas	.08	@	.08¼

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04¼	@	—
White No. 1—			
Repacked	4.75	@	5.25
Miscellaneous	—	@	4.00
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Twos and Blues	2.25	@	2.50
Thirds and Blues—			
Repacked	1.15	@	1.25
Miscellaneous	1.00	@	1.20
Black Stockings	3.25	@	3.50
Roofing Stock—			
No. 1	—	@	.58
No. 2	—	@	.43
No. 3	—	@	.31

Foreign Rags

(F. o. b. Boston)

Dark Cottons	—	@	.55
New No. 1 White Shirt Cuttings	—	@	5.25
Dutch Blues	—	@	1.80
New Checks & Blues	4.00	@	4.50
Old Fustians	1.25	@	1.50
Old Linsey Garments	—	@	.70

TORONTO

Paper

(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.10¾	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.11¾	@	—
No. 2 Colored	.09	@	.10½
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
Book—			
No. 1 M. F. (carloads)	6.65	@	—
No. 3 M. F. (carloads)	6.20	@	—
No. 1 S. C. (carloads)	7.15	@	—
No. 3 S. C. (carloads)	6.65	@	—
No. 4 S. C. (carloads)	5.70	@	—
No. 1 Coated and Litho	12.50	@	—
No. 2 Coated and Litho	11.50	@	—
No. 3 Coated and Litho	10.00	@	11.50
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.60	@	—
White Wrap	5.10	@	—
"B" Manila	5.00	@	—
No. 1 Manila	5.60	@	—
Fiber	5.60	@	—
Kraft, M. F.	5.98	@	—
Kraft No. 2	5.60	@	—

(Delivered Toronto)

News, per ton—			
Rolls (contract)	56.50	@	57.00
Sheets	61.50	@	—

Pulp

(F. o. b. Mill)

Ground Wood	30.00	@	32.00
Sulphite easy bleaching	50.00	@	—
Sulphite, news grade	44.00	@	—
Sulphite, bleached	62.50	@	75.00
Sulphate	60.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.60	@	—
Soft White	2.40	@	—
White Blk. News	1.40	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	—
Light and Crumpled Book Stock	1.05	@	—
Ledgers and Writings	—	@	—
Manilas—			
New Manila Cut	1.40	@	—
Printed Manilas	.50	@	—
Kraft	1.65	@	—
News and Scrap—			
Strictly Overissue	.50	@	—
Strictly Folded	.45	@	—
No. 1 Mixed Paper	.35	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.89½	@	[illegible]
Fancy Shirt Cuttings	.06	@	.06¼

The Pump Shaft Must Have a Packing That Retains Its Lubricant Under All Service Conditions.

For Steam (Superheat) and Compressed Air

For Water (Hot and Cold) Calcium Brine, Centrifugal and Reciprocating Pumps.

For Caustic Soda, Acids, Alkalis.

For Gasoline, Naphtha and all Distillates of Petroleum.

SHAFT Friction Will Run Up Production Costs

Friction is caused by a lack of lubricant on the packing-bearing surface of the shaft.

These packings not only carry sufficient lubricant to avoid shaft friction, but each packing is abundantly supplied with a lubricant best suited to the conditions under which it must work.

SEND FOR THIS CHART, HANG IT UP FOR READY REFERENCE.

GREENE, TWEED & CO.

Sole Manufacturers

109 Duane St. New York

If you desire working sample state size and conditions of service.

PAPER TRADE JOURNAL

ESTABLISHED 1872

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

SIXTIETH YEAR

Published Every Thursday by the

LOCKWOOD TRADE JOURNAL CO., Inc.

GEO. S. MACDONALD, President: J. BANNINGA, Sec.-Treas.

Published at 34 No. Crystal St., East Stroudsburg, Pa.

Executive and Editorial Offices: 10 East 39th Street, New York

Chicago Office: 123 West Madison St.

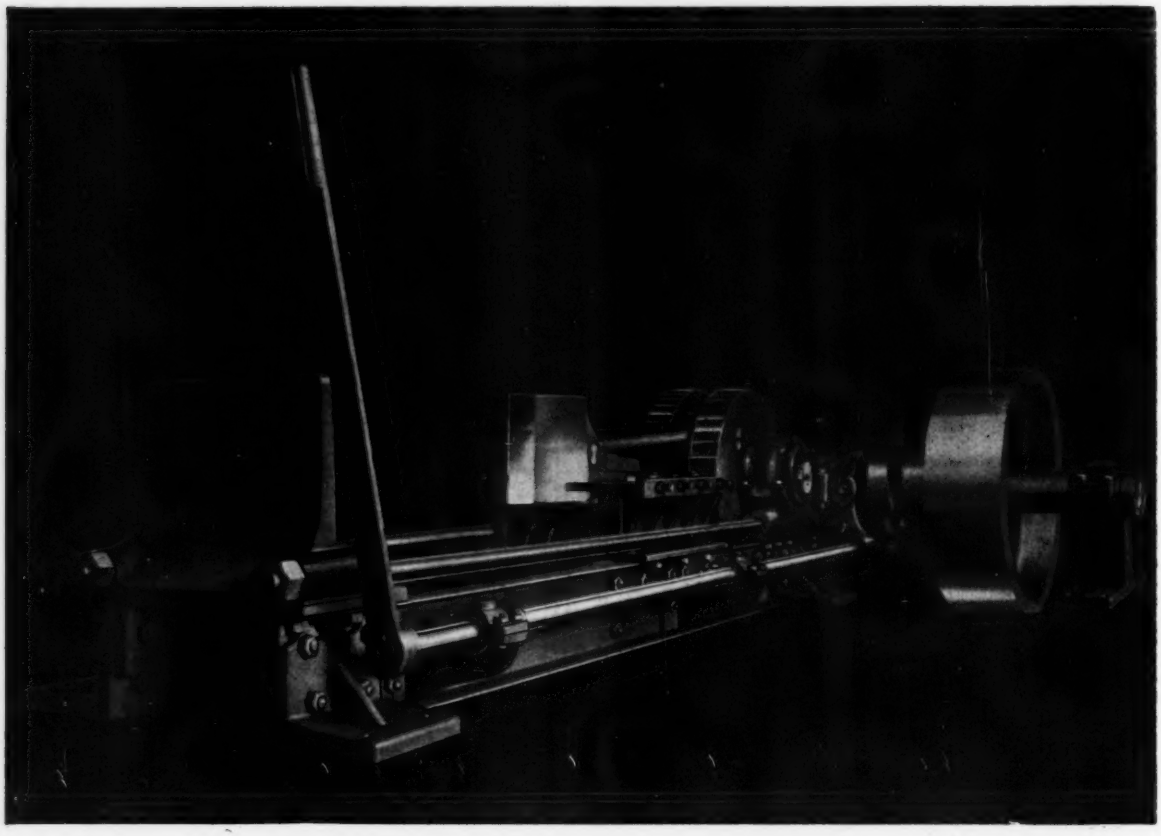
TABLE OF CONTENTS

Copyright, 1931, by the Lockwood Trade Journal Co., Inc.

Badger Paper Mills Position Improving 13
Mills Guarantee Employment 13
Forest Production Movements 13
Philadelphia Market Fairly Active 14
Paper and Cordage Association Meets 14
McDowell Paper Mills on Glassine 14
Fewer Fire Losses 14
Ontario Manufacturers Well Employed 16
Enquires Coming from Overseas 16
Paper Demand Below Normal in Chicago 18
Chicago Association Elects Officers 18
Gatineau Plans New Development 18
Boston Market Moderately Busy 20
Free Trips to Leipzig Fair 20
Need for Institute of Paper Chemistry 22
Obituary 24
Construction News 26
Norman Chip Duster 28
Leading Regulator Companies Unite 28
New York Trade Jottings 30
Editorial 32
Bids and Awards for Government Paper 33
Leaves Bryant Paper Co. 33
TAPPI Notes 33
Making Packing Cases at Longview 33
To Be Editor of Papier-Zeitung 33
Technical Section
Patents and the Employer and Employee 35
New TAPPI Members 35
Loss in Yield and Quality of Pulp in Digesters Which Were Not Blown Clean.. 36
Preparation of Wholestuff 40
Current Paper Trade Literature 41
Cost Section 47
Shlick Beater Developments 50
New Pressure Control Instrument 50
Imports of Paper and Paper Stock 52
New York Market Review 56
Miscellaneous Markets 58
Market Quotations 58

THE PAPER TRADE JOURNAL is indexed in Industrial Arts Index

Want and For Sale Advertisements, 61-62



. . . large PRODUCTION . . . SAFETY for the operator and ECONOMY in operation are performance features of the APPLETON HORIZONTAL SPLITTER

. . . Production is greatly increased when the Appleton Horizontal Splitter is used to split large size pulp wood. One man is in complete control, operating the splitter and conveyor and handling the wood, yet increased production is maintained. The operator is never in danger for there are no flying splinters with this splitter. And besides production and safety features there are operating economies that help to make the Appleton Horizontal Splitter the standard of comparison. Full particulars will be sent upon request.

THE APPLETON MACHINE COMPANY . . . . . APPLETON, WISCONSIN

. . FLAT SCREENS . JORDANS . JORDAN FILLINGS . LABORATORY EQUIPMENT . .
CALENDER ROLLS . WET MACHINES . CYLINDER MOLDS
VALVES . WAXING MACHINES . PUMPS
DECKERS . CHIPPERS
ETC.